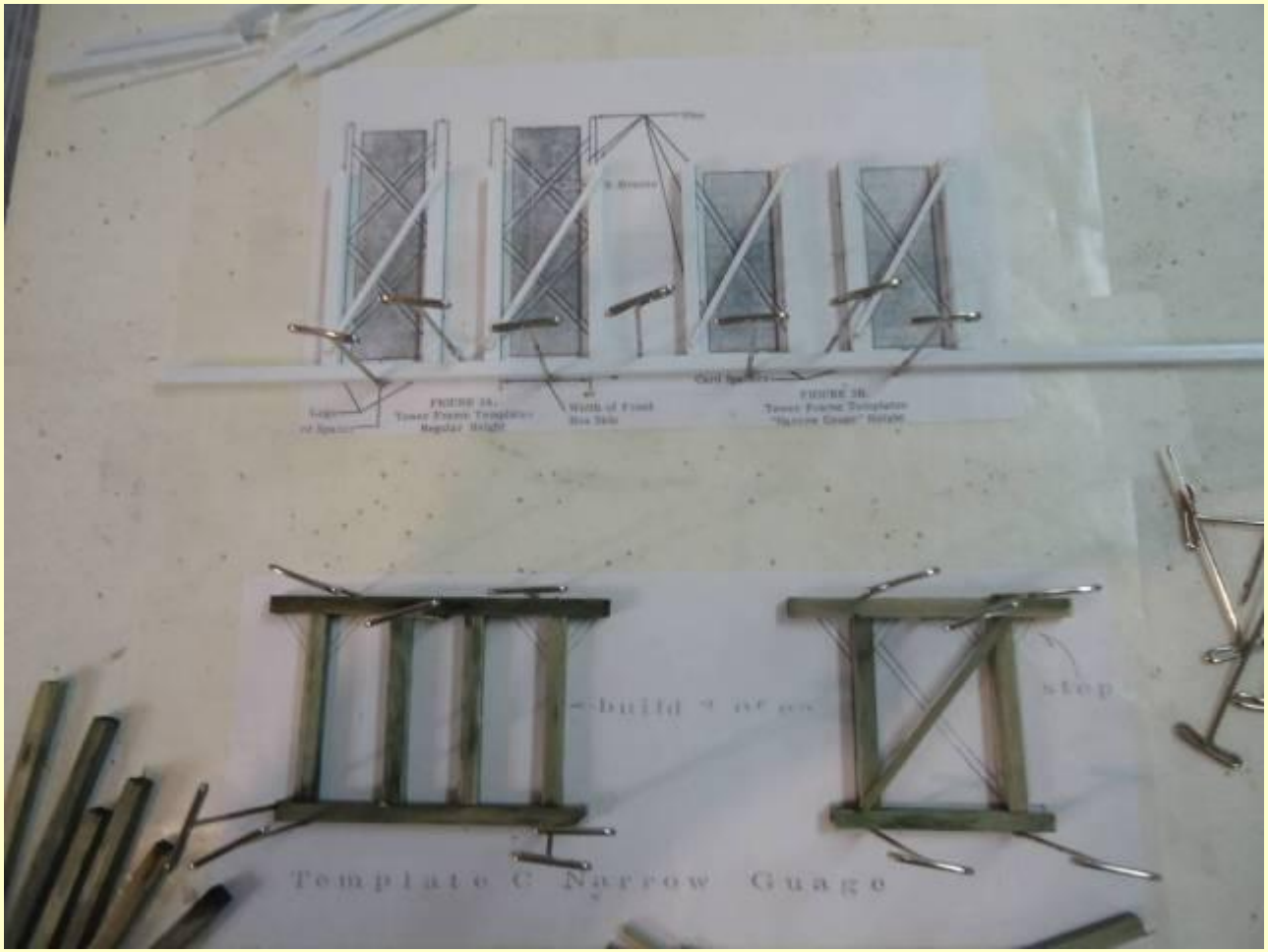
Scratch Build a Water Tower

Part 1
Building the base

Scratch Build a Water Tower

Before we really get started there's a couple of things to consider



Build in wood or styrene?

Scratch Build a Water Tower

Before we really get started there's a couple of things to consider

What Scale are you going to build your Water Tower in?

The plans are in HO-Scale,
Find a copier and adjust the copies of your plan as indicated below:

Z = 39.6%
N = 54.4%
S = 136.1%
O = 181.5%
G = 387.1%

Scratch Build a Water Tower

Before we really get started there's a couple of things to consider

Pre-Stain all wood before gluing, the glue will not take the stain

Add wood grain with a razor saw and a wire brush to all styrene

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Before we really get started there's a couple of things to consider

Standard Gauge or Narrow Gauge?

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Before we really get started there's a couple of things to consider

Cement footings or Timber?

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Before we really get started there's a couple of things to consider

Frost box, fully enclosed Northern style, or no Frost protection

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Before we really get started there's a couple of things to consider

Mainline tank or small branch line?

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Before we really get started there's a couple of things to consider

Straight sides or tapered sides?

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Before we really get started there's a couple of things to consider

Round tank bands of flat?

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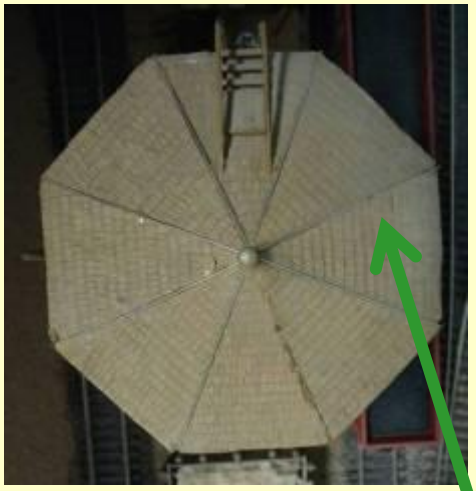
Before we really get started there's a couple of things to consider



Roof style? Flat; Hexagon; Round; No roof

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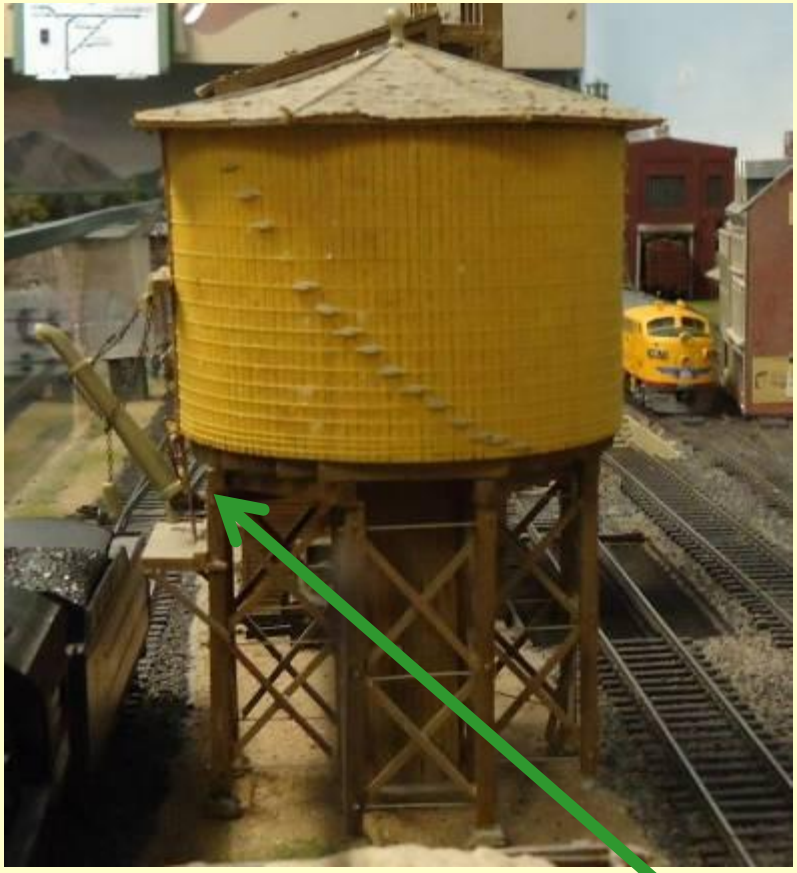
Before we really get started there's a couple of things to consider



Water spout on one side or both sides?

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Or maybe you want a specialty tank like these

Small Horizontal tank

Double tank tower

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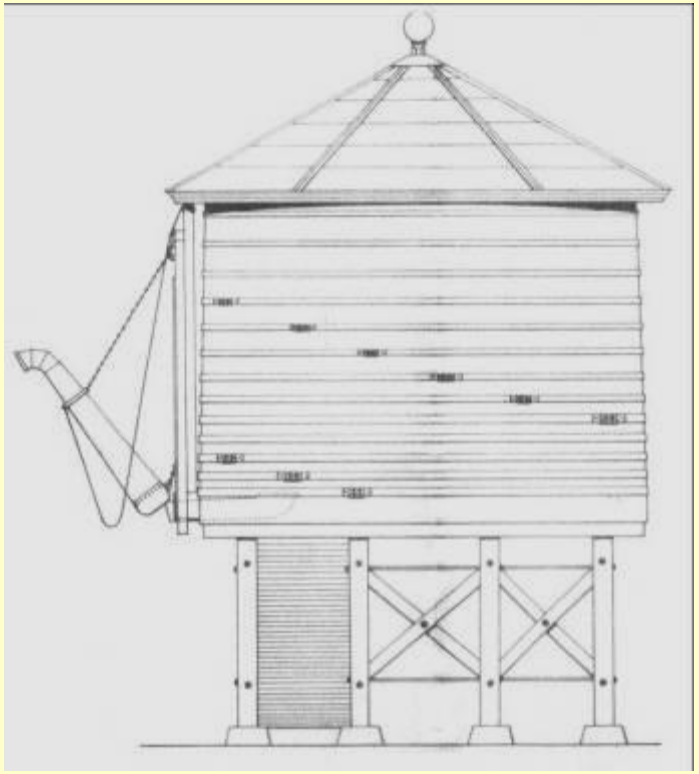
Three different set of plans to start from



D&RGW Water Tank by Durango Press

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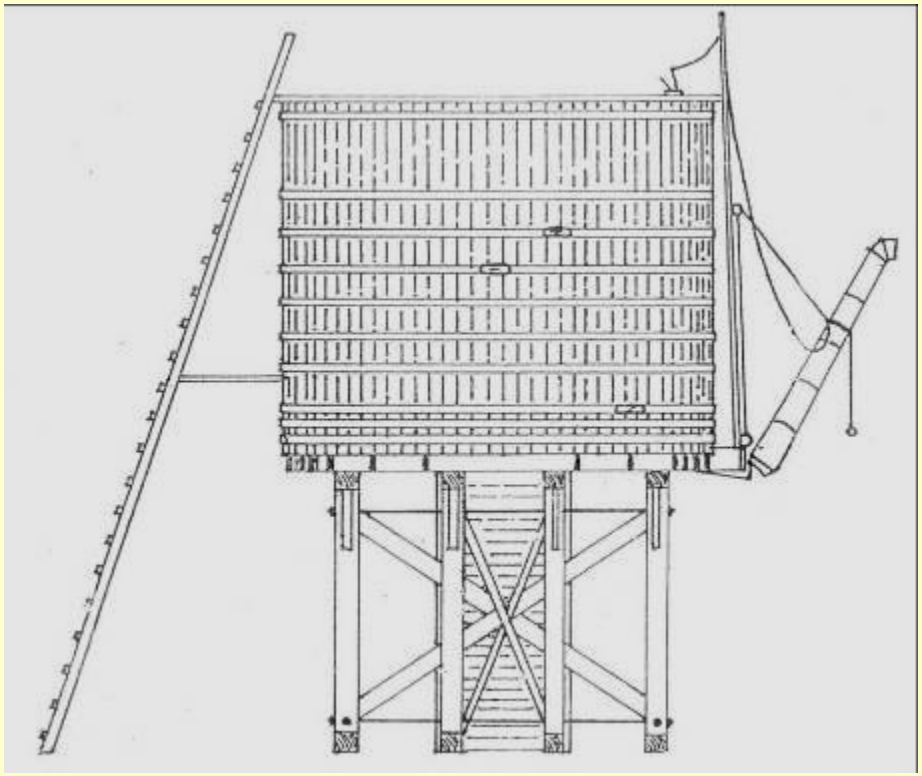
Three different set of plans to start from



The Baker Tank by Centennial Models

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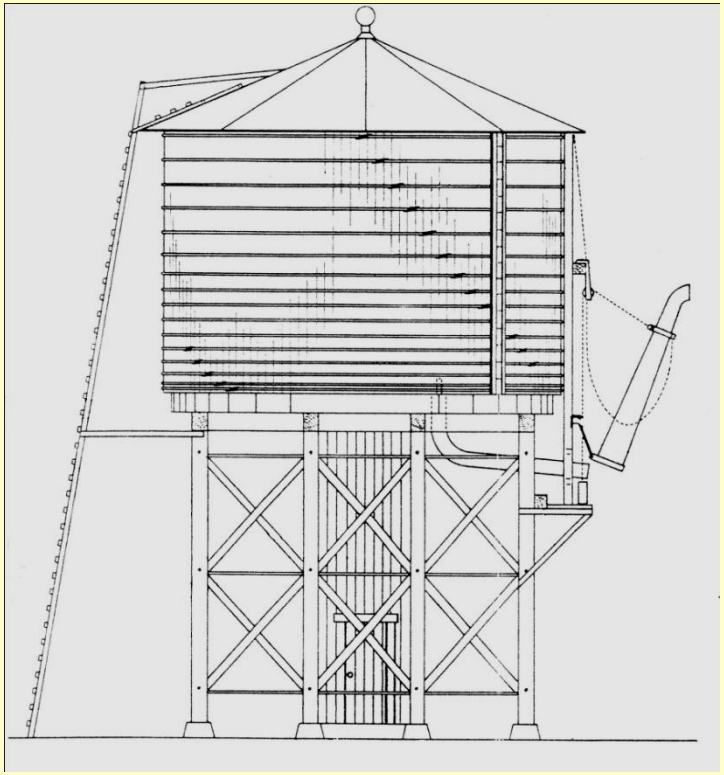
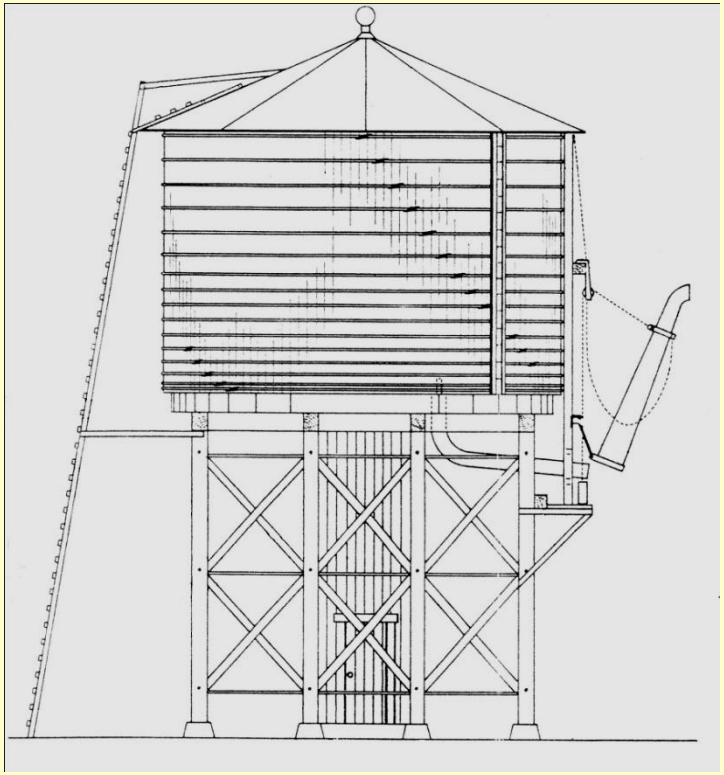
Three different set of plans to start from



The Water Tank by Campbell Scale Models

Scratch Build a Water Tower

This clinic is written for the "Campbells" tank

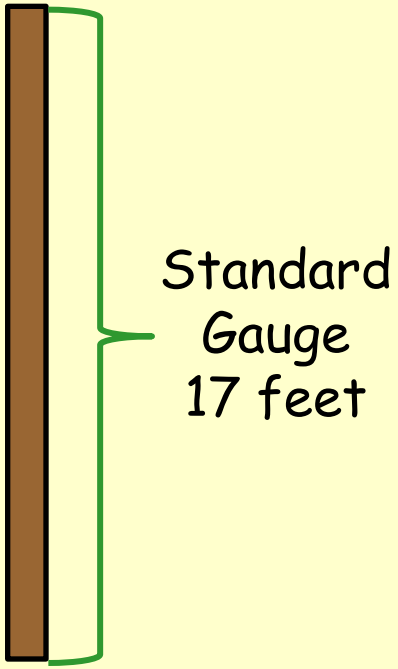


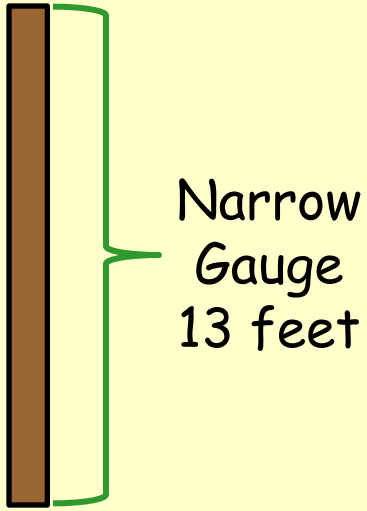
If you plan on using one of the other plans you will have to make adjustments as you go

Scratch Build a Water Tower

We'll begin this project by cutting 12 legs out of 12x12 material

Wood – always pre-stain before gluing
Styrene – always add wood grain before gluing



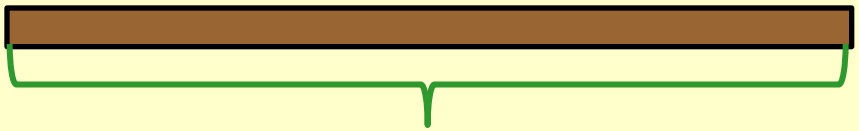


Scratch Build a Water Tower

Cut TWO long Cap Timbers and TWO short Cap Timbers
out of 12x12 material

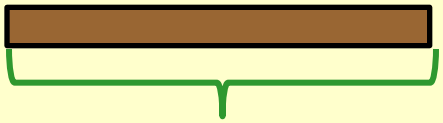
Wood – always pre-stain before gluing
Styrene – always add wood grain before gluing

If you plan on Timber footings then cut TWO MORE of EACH for the bases



2 Long Cap Timbers, 22 feet long

Adjust the length if you are going to use a different size tank



2 Short Cap Timbers, ½ length of long Cap Timber

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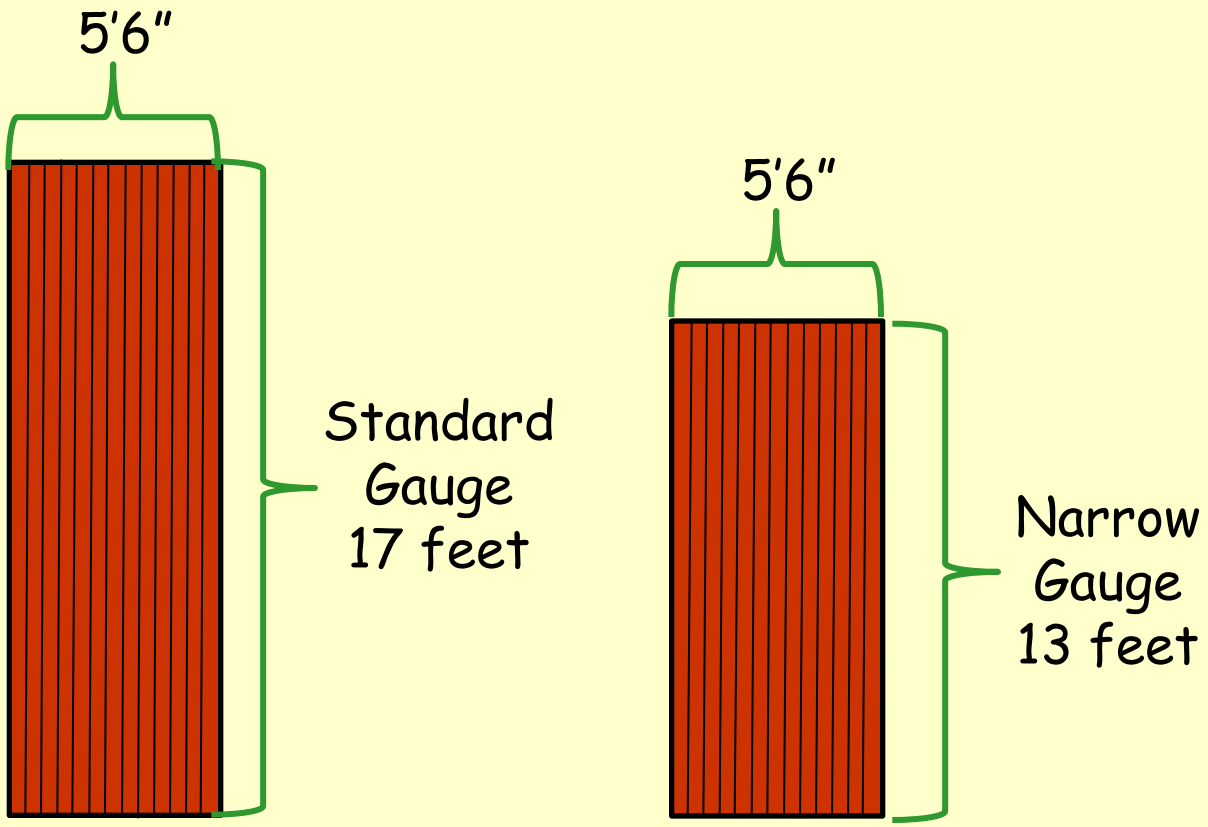
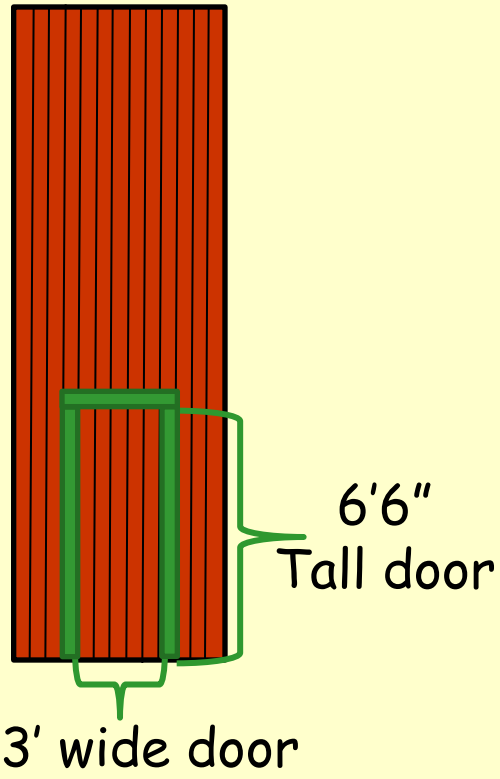
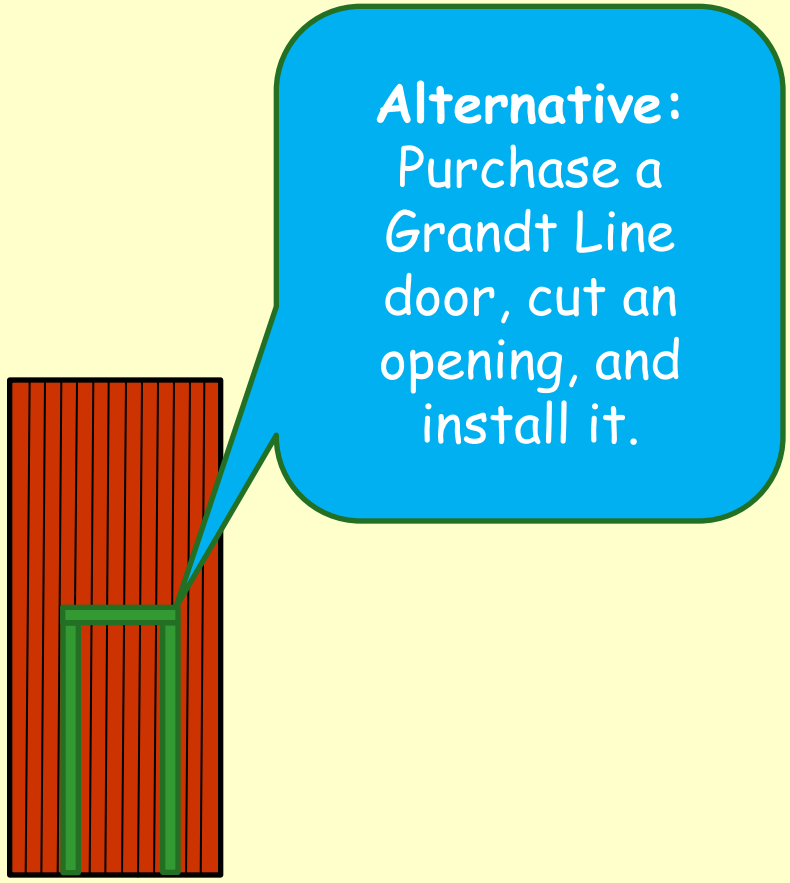
Now we'll cut the 4 frost box walls out of the scribed siding material



Scratch Build a Water Tower

Next, we need to add a door to ONE of the wall sections using 2x4 material





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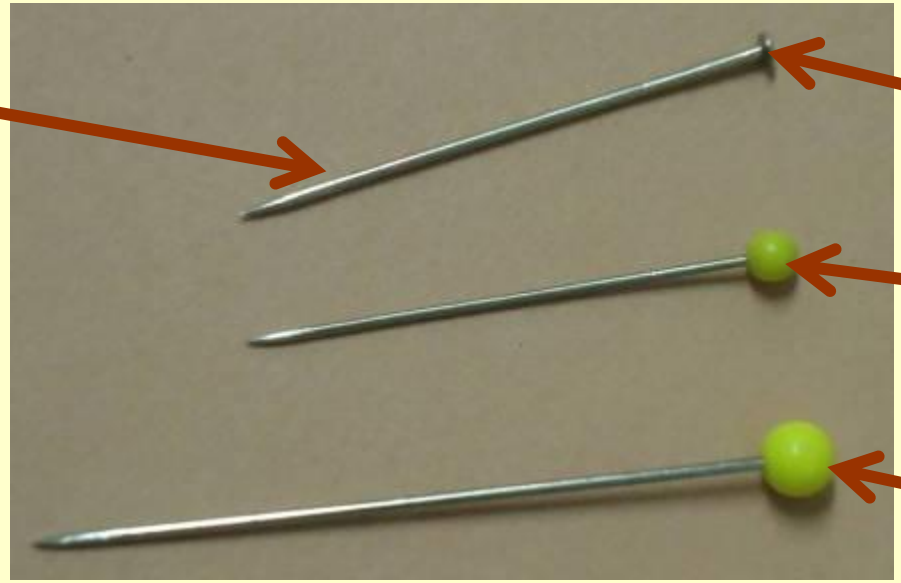
Don't forget about a door knob.

N Scale = use an **ordinary straight pin** and cut off the head

HO & S Scales use an **ordinary straight pin** with the head

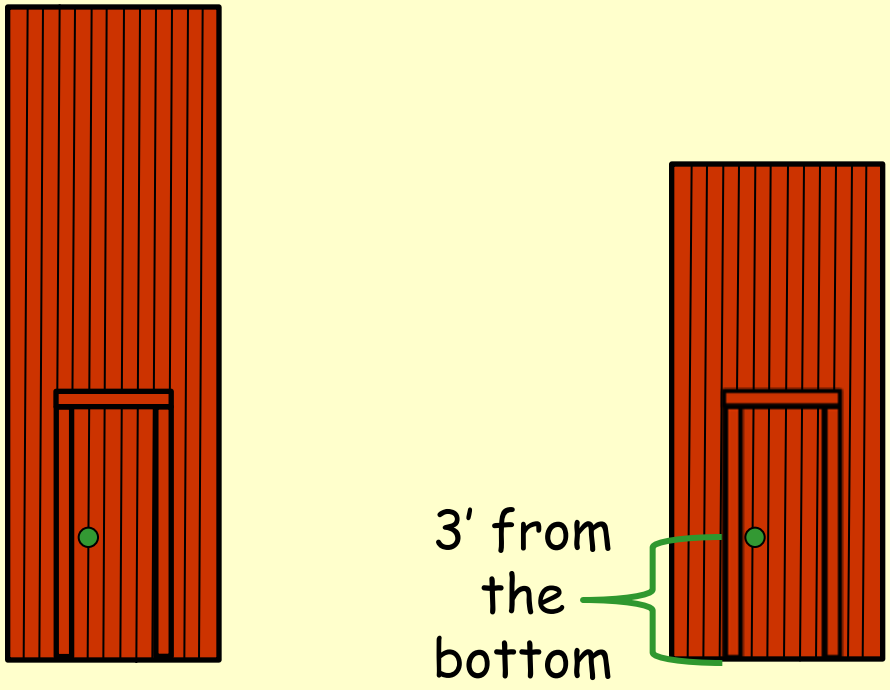
O & G scales use a **dress maker pin** with an appropriate sized head



Scratch Build a Water Tower

Don't forget about a door knob.

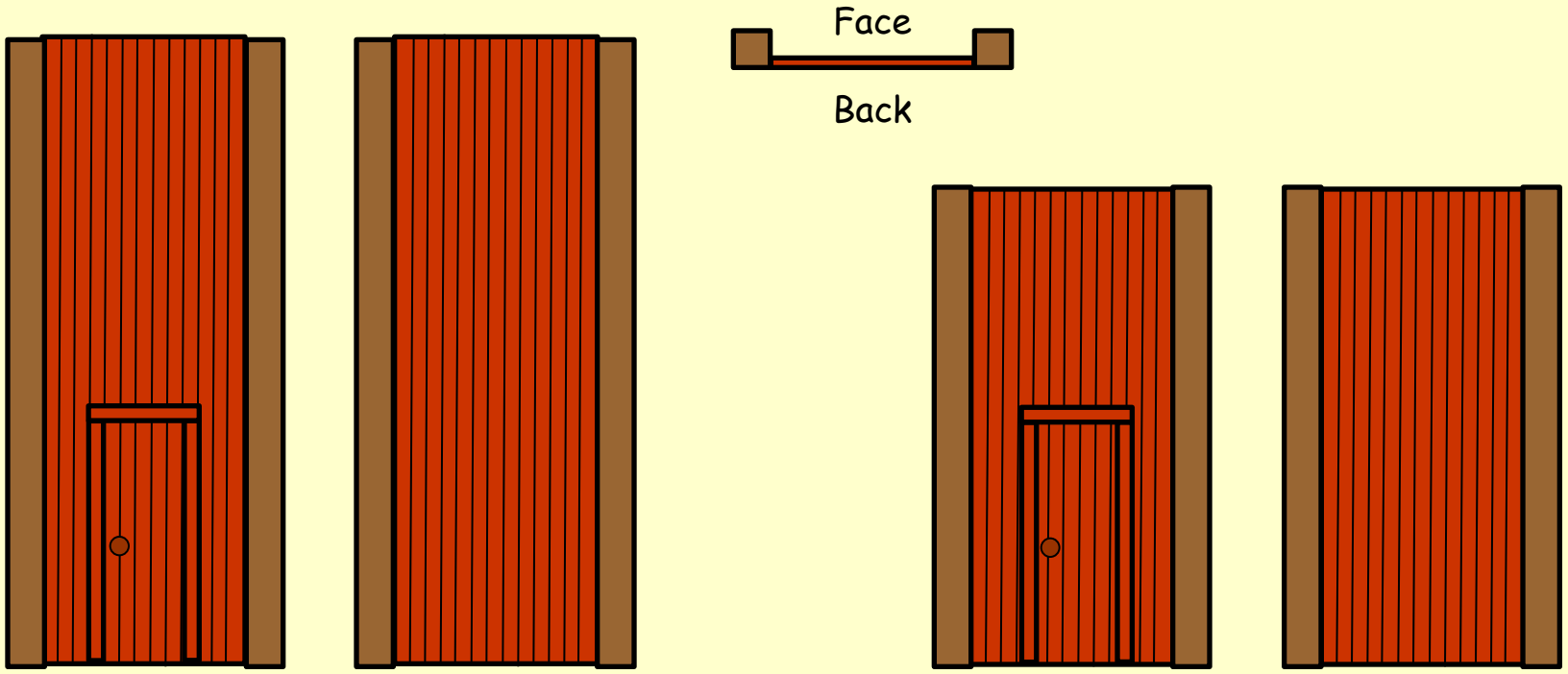
Drill a hole the size of your pin, 3' feet from the bottom,
Insert the pin and cut off the excess from the back



Scratch Build a Water Tower

Building the Frost box

Start with 2 of the walls and edge glue a leg on each side



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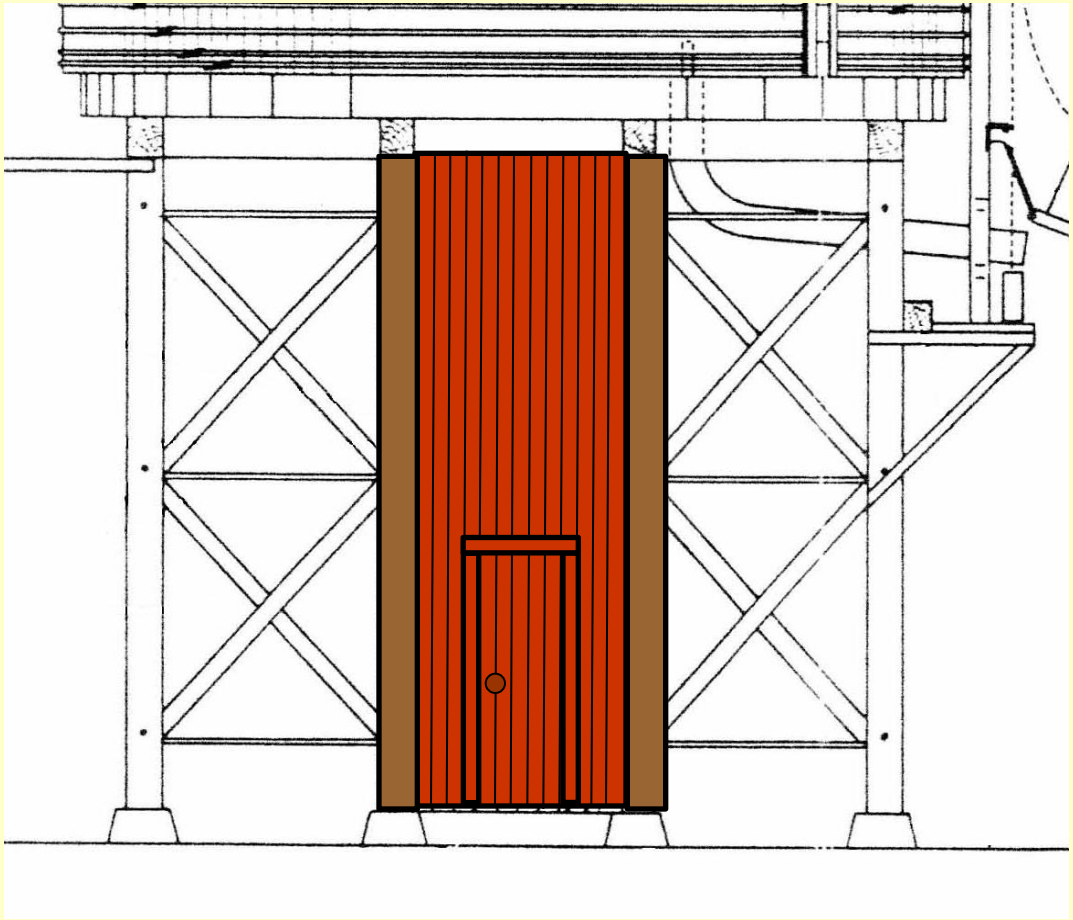
Now attach the front wall assembly to the template

Option:
Cover the template with wax paper and use double sided tape
Or
Glue directly onto the template and clean up after



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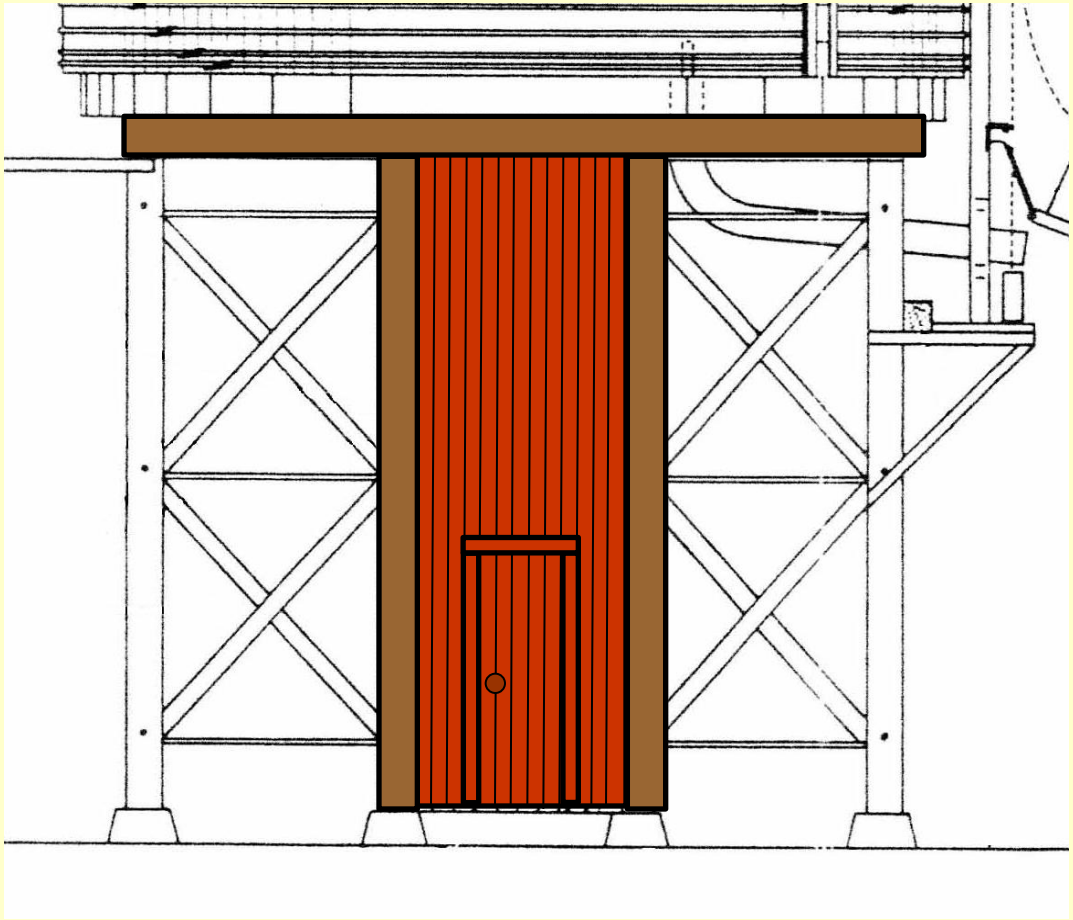
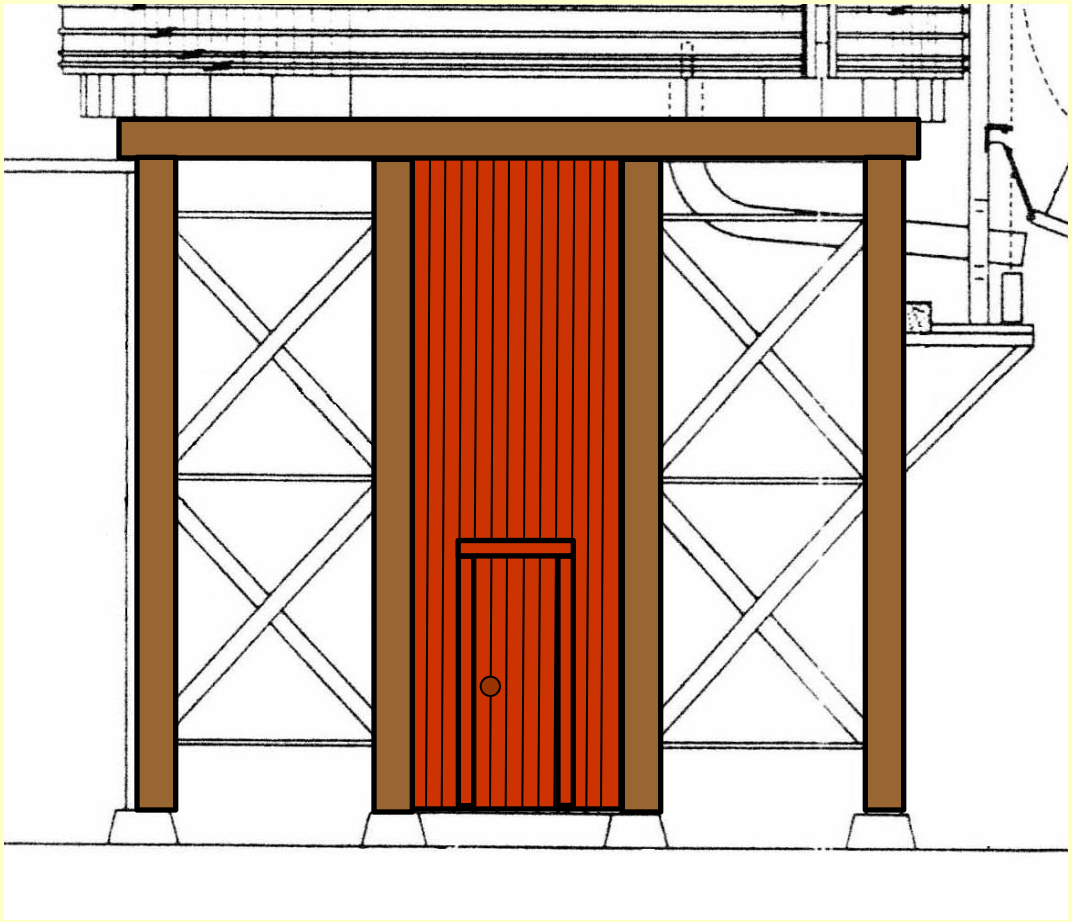
Glue the Cap Timber on top of the wall and centered



Scratch Build a Water Tower

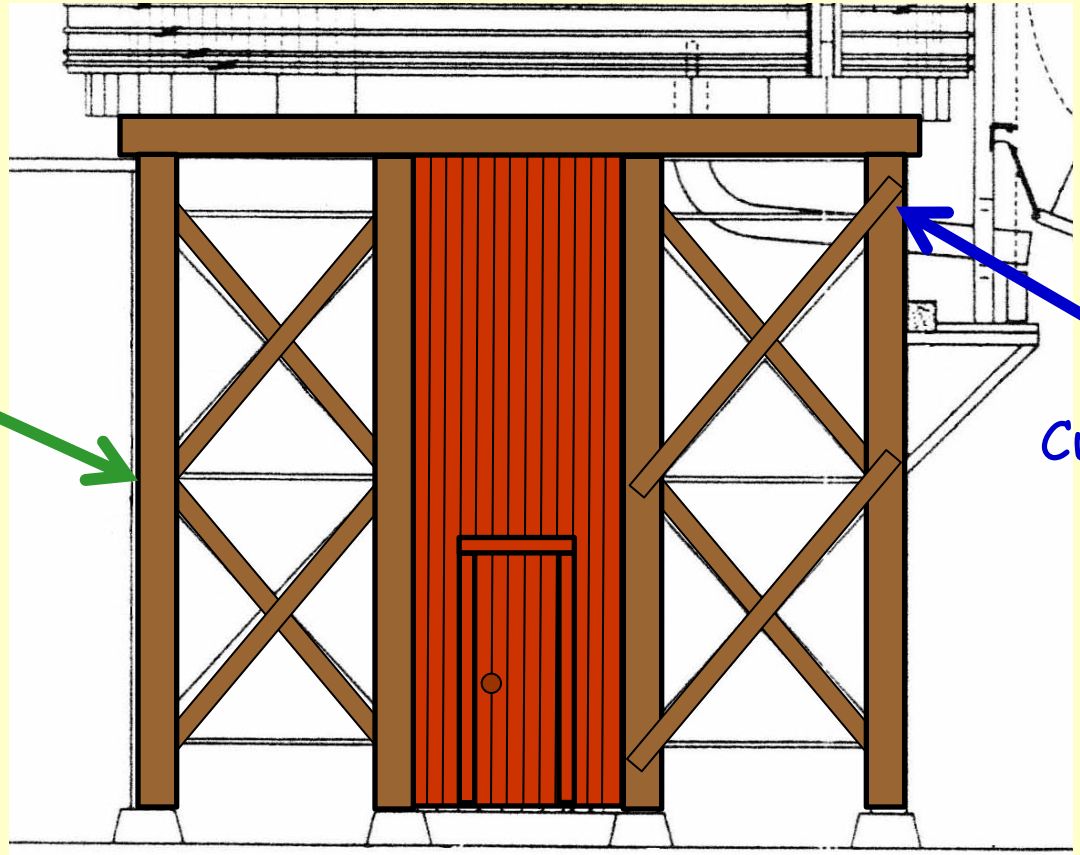
and attach TWO more legs to the Cap Timber



Scratch Build a Water Tower

Then add the Cross Bracing using 4x6 material (2x6 in larger scales)

Cut Diagonal and attach to insides of legs

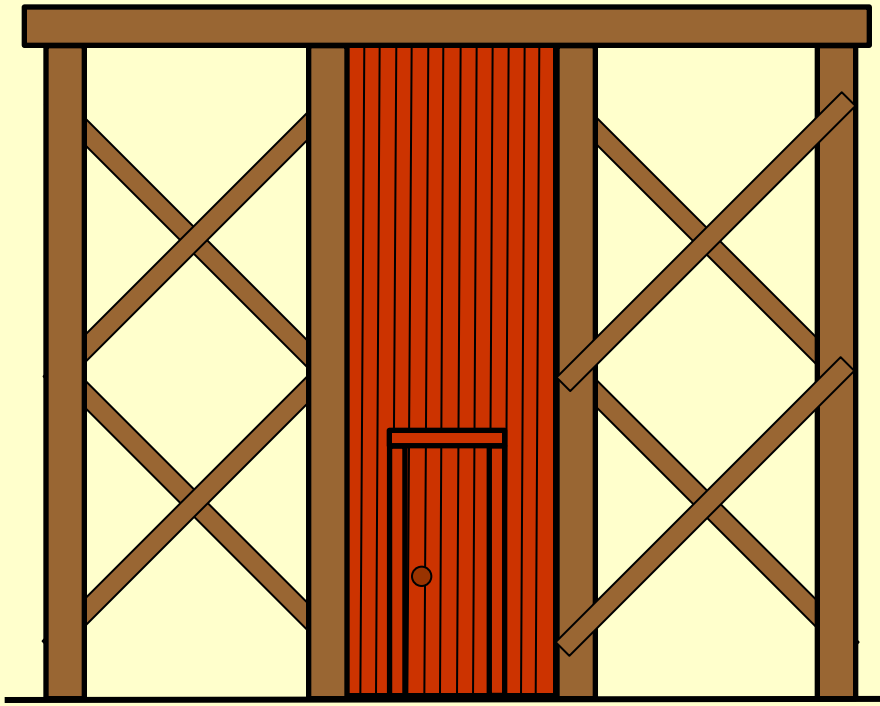


Cut Square and attach to outsides of legs

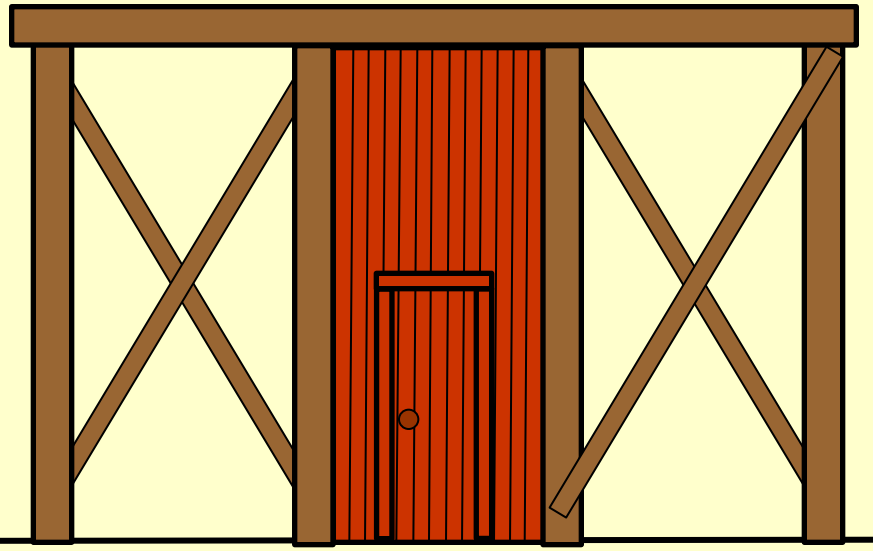
Two methods to choose from

Scratch Build a Water Tower

Shown here is the X-bracing for both Gauges



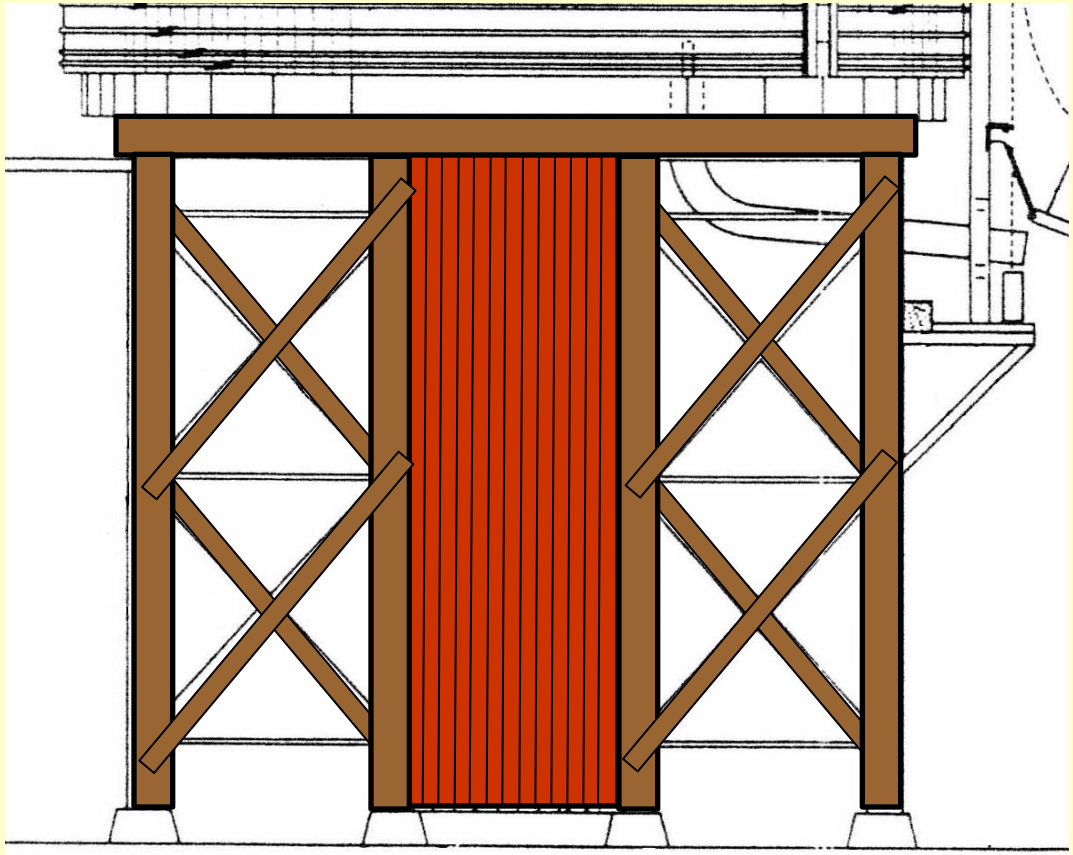
Standard Gauge



Narrow Gauge

Scratch Build a Water Tower

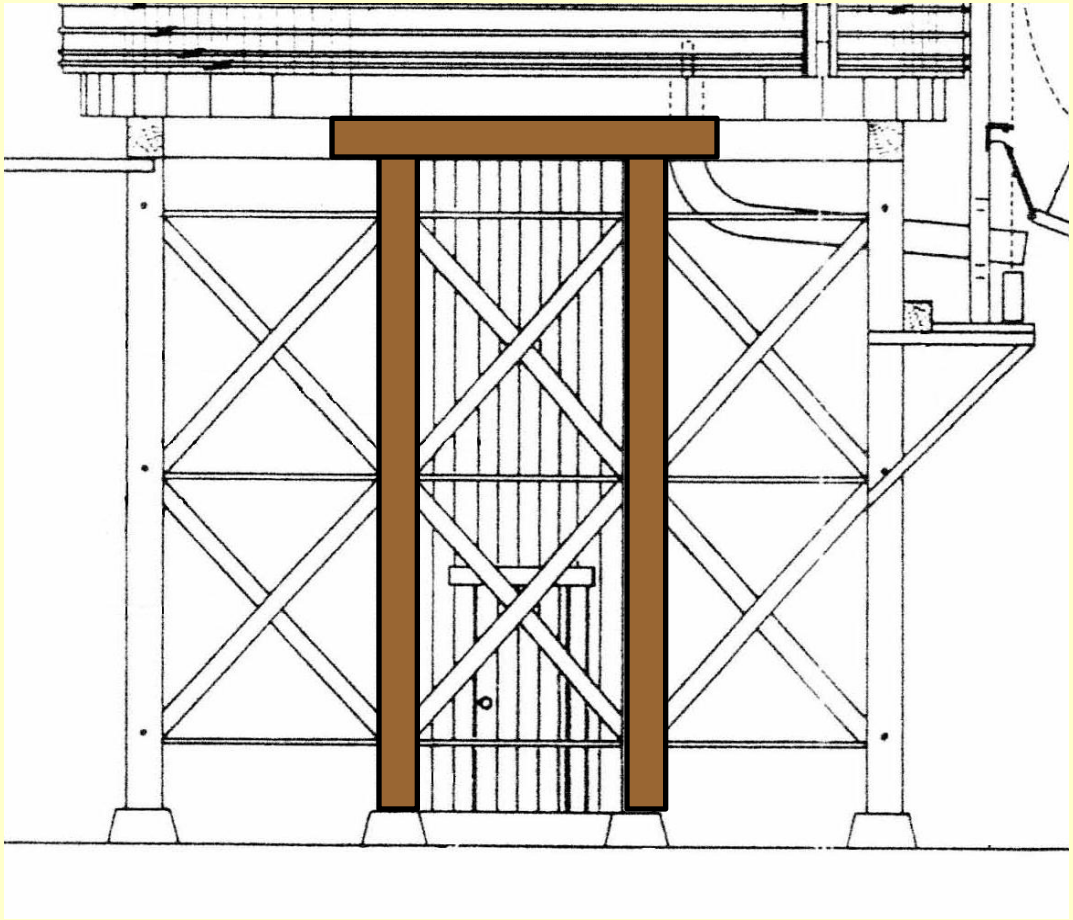
Repeat the last4 steps for the back wall



Two methods to choose from

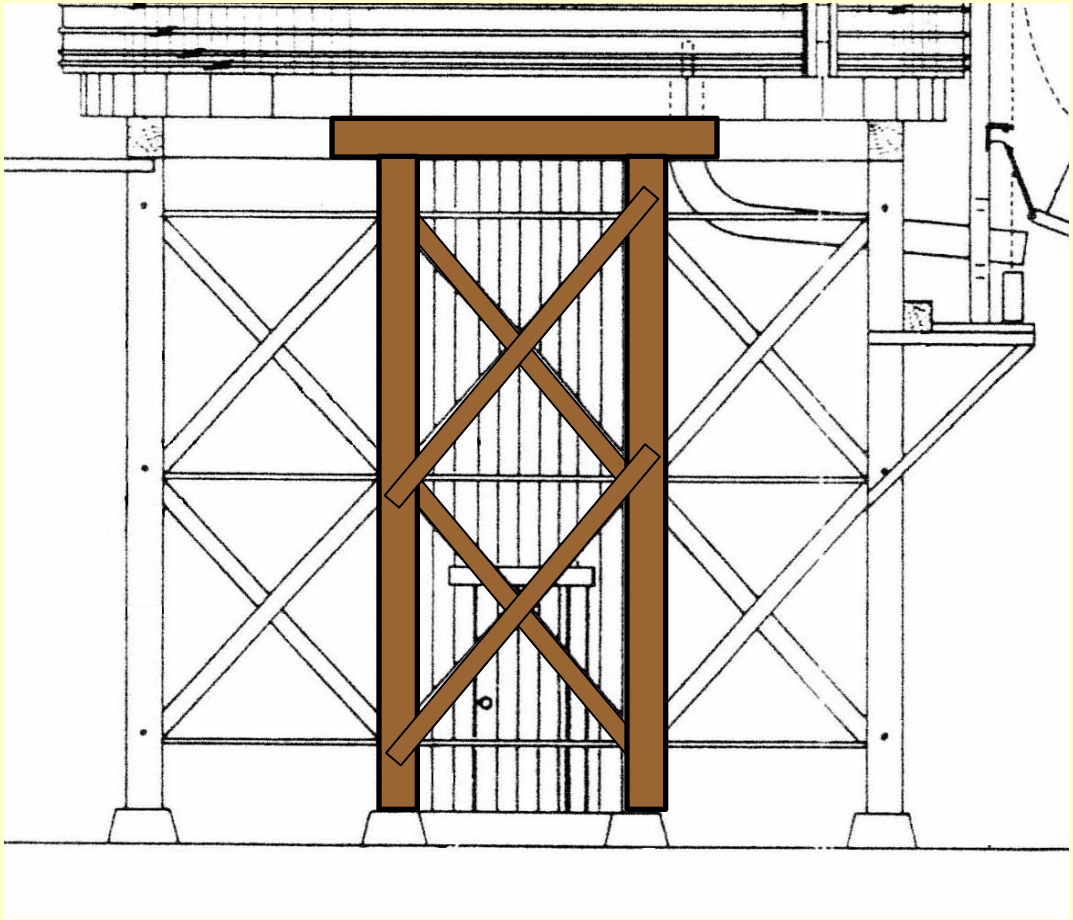
Scratch Build a Water Tower

Secure 2 legs to the drawing and glue one of the short Cap Timbers on top, centered



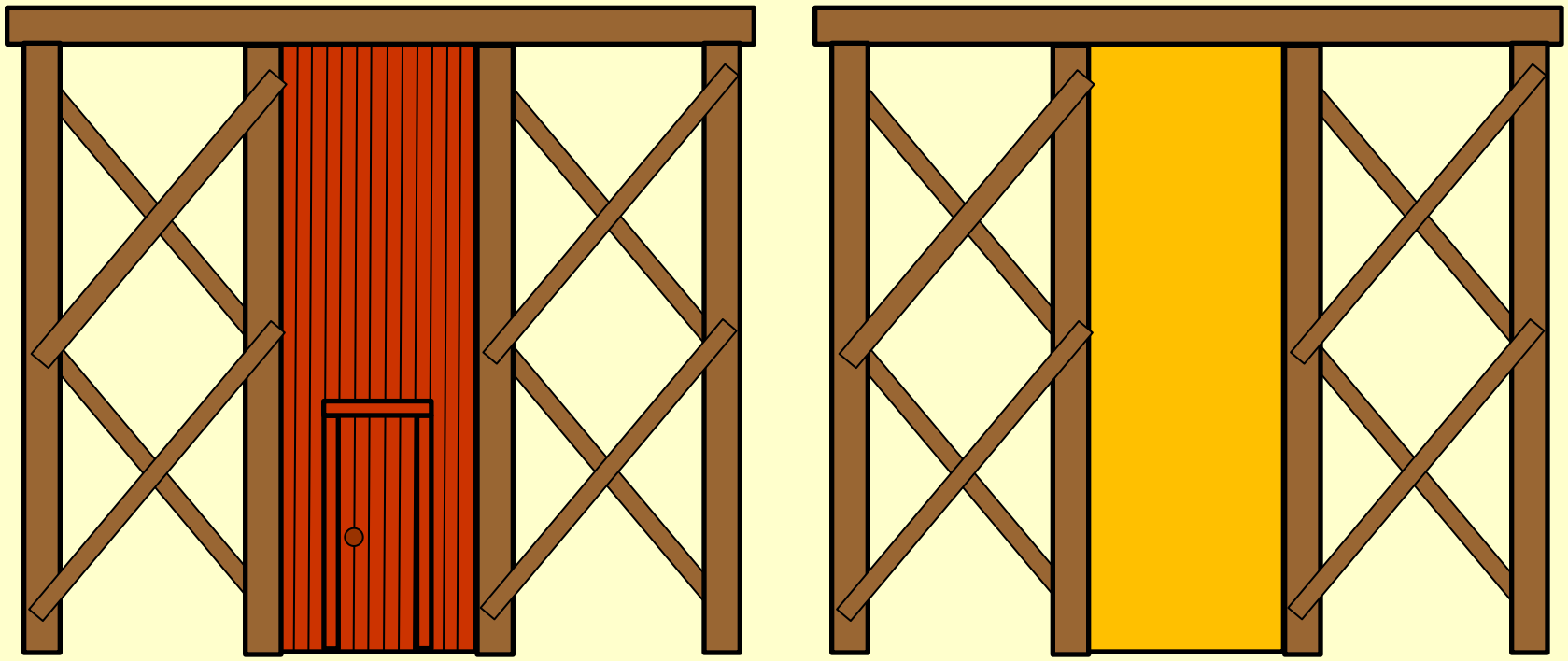
Scratch Build a Water Tower

Now add the X-Bracing – Don't forget to build 2 of these assemblies



Scratch Build a Water Tower

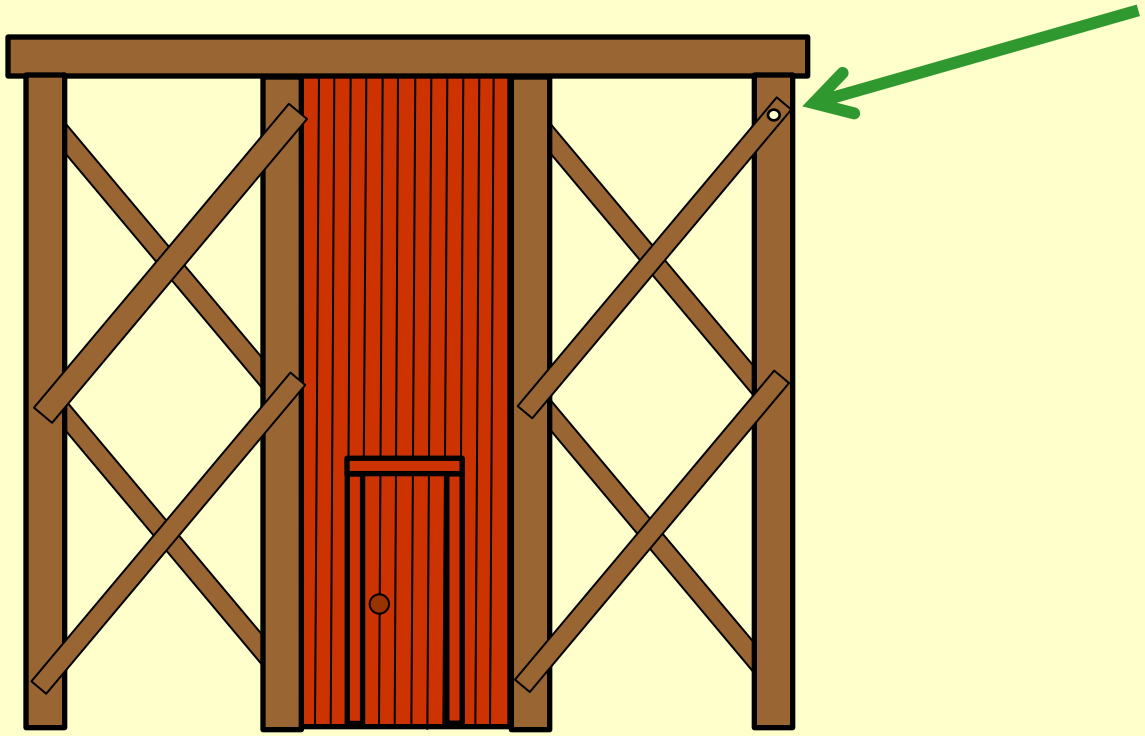
Now lay the back wall on your work surface face down



Then lay the front wall on top of the back wall face up
And align everything

Scratch Build a Water Tower

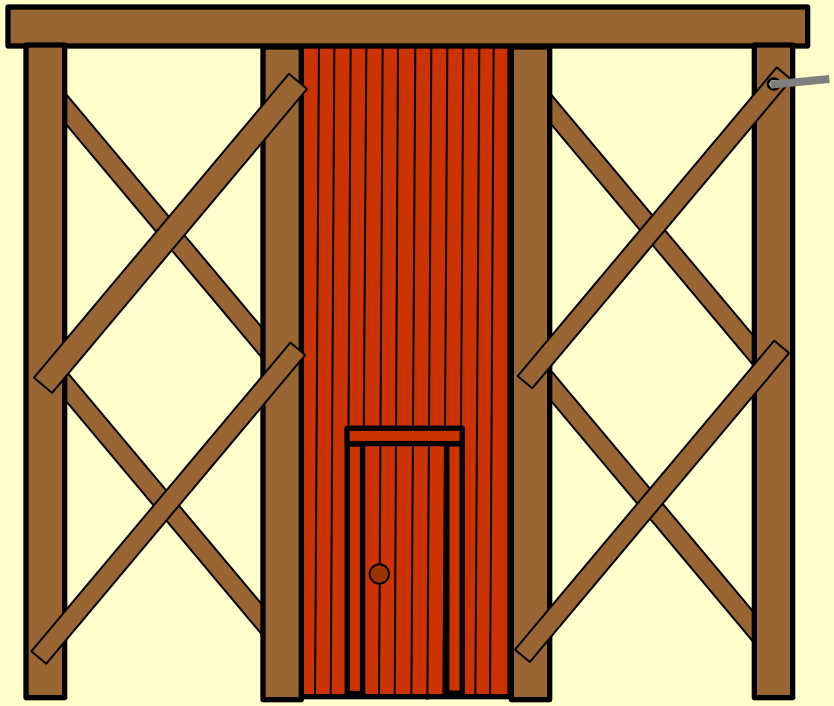
Now, holding everything steady, drill a small hole through the upper right X-bracing all the way through both assemblies



Drill size depends on the size of the rods you will be using for the tension rods

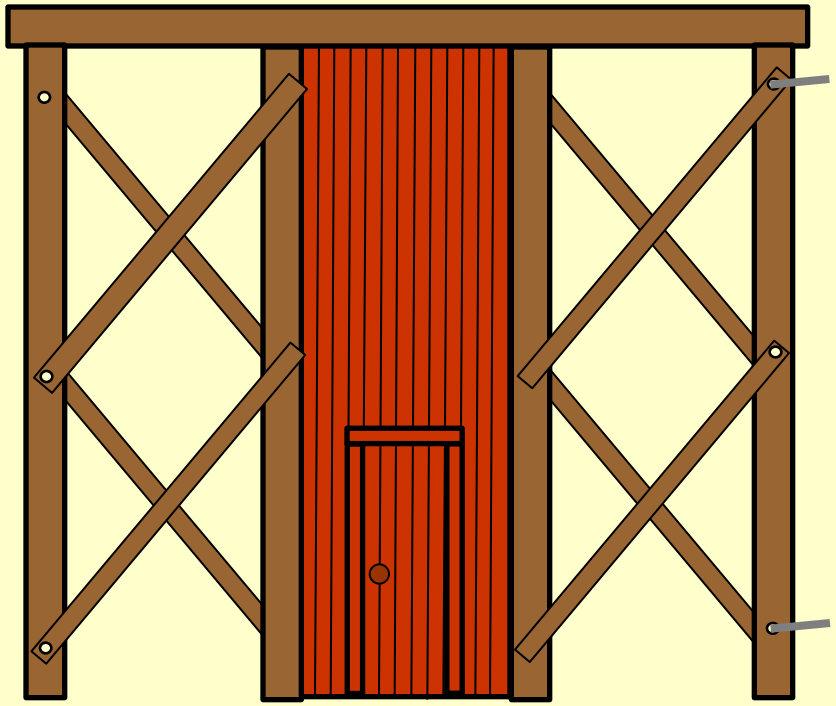
Scratch Build a Water Tower

Insert a slightly over length piece of your rod material to maintain alignment



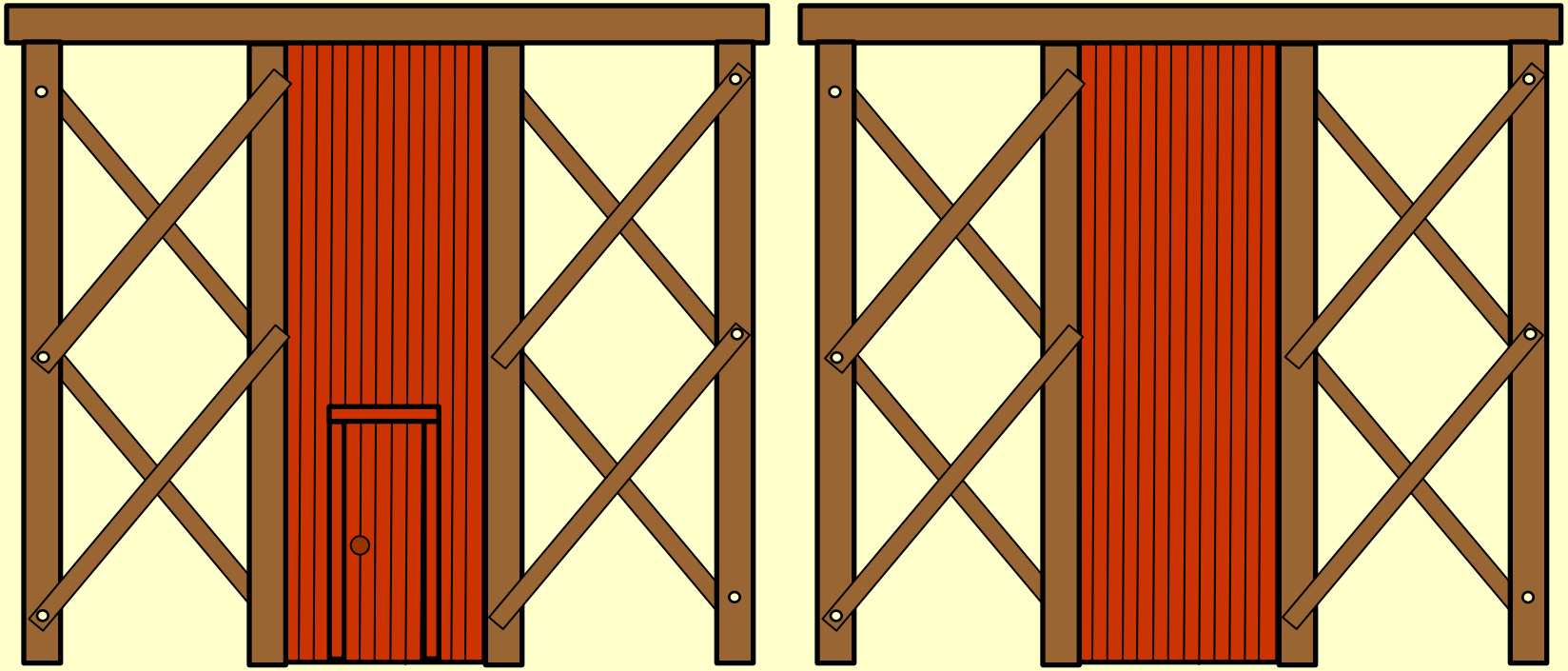
Scratch Build a Water Tower

Drill the remaining rod holes in the outside legs, inserting at least 1 more rod to keep alignment



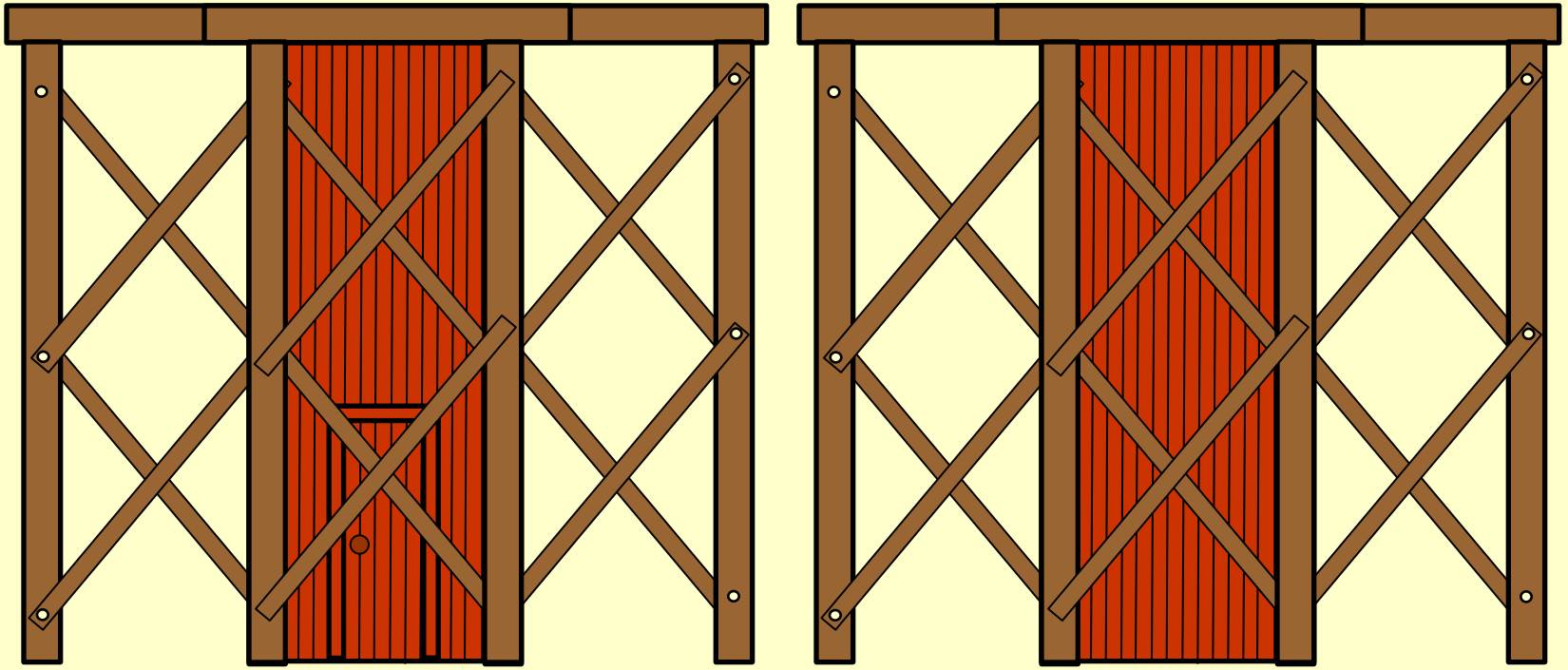
Scratch Build a Water Tower

With all holes drilled you can separate the assemblies and lay them on your work surface face up



Scratch Build a Water Tower

Now lay a short bent on top of each of them, centered



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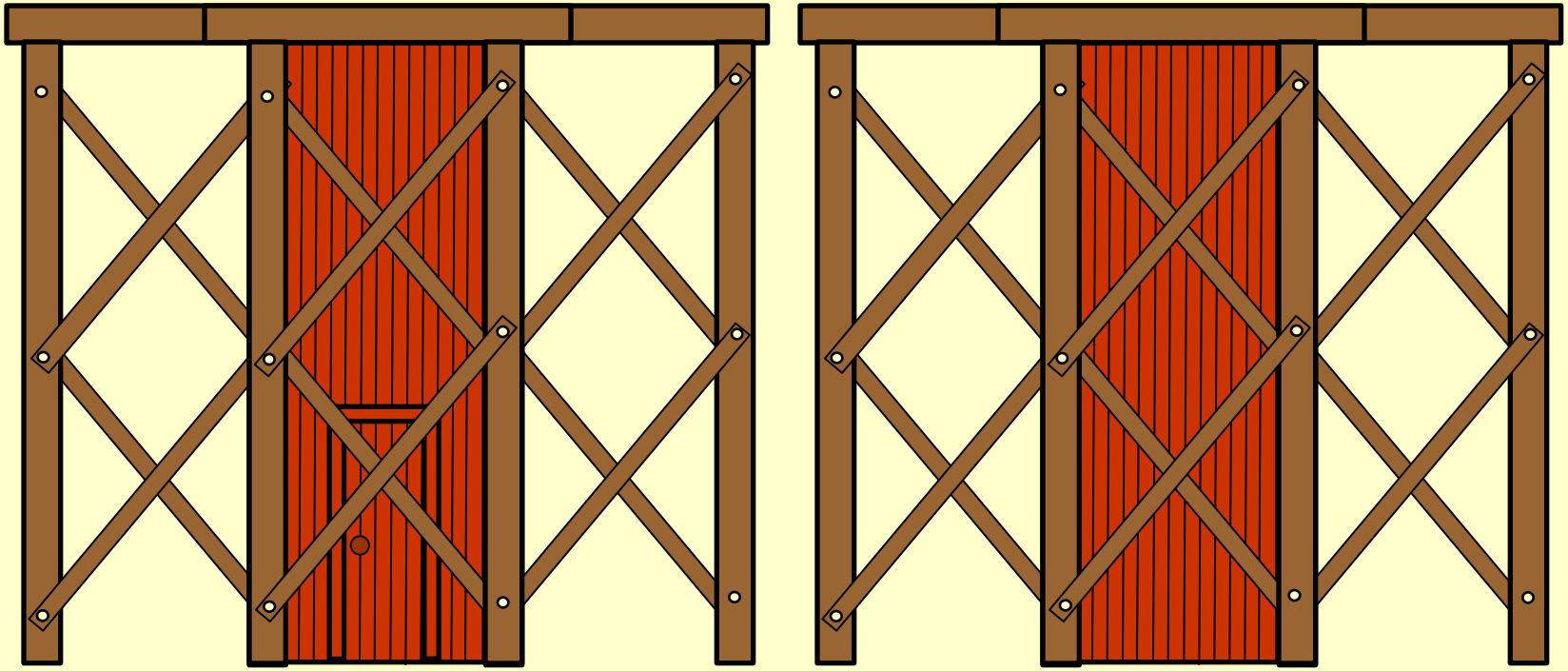
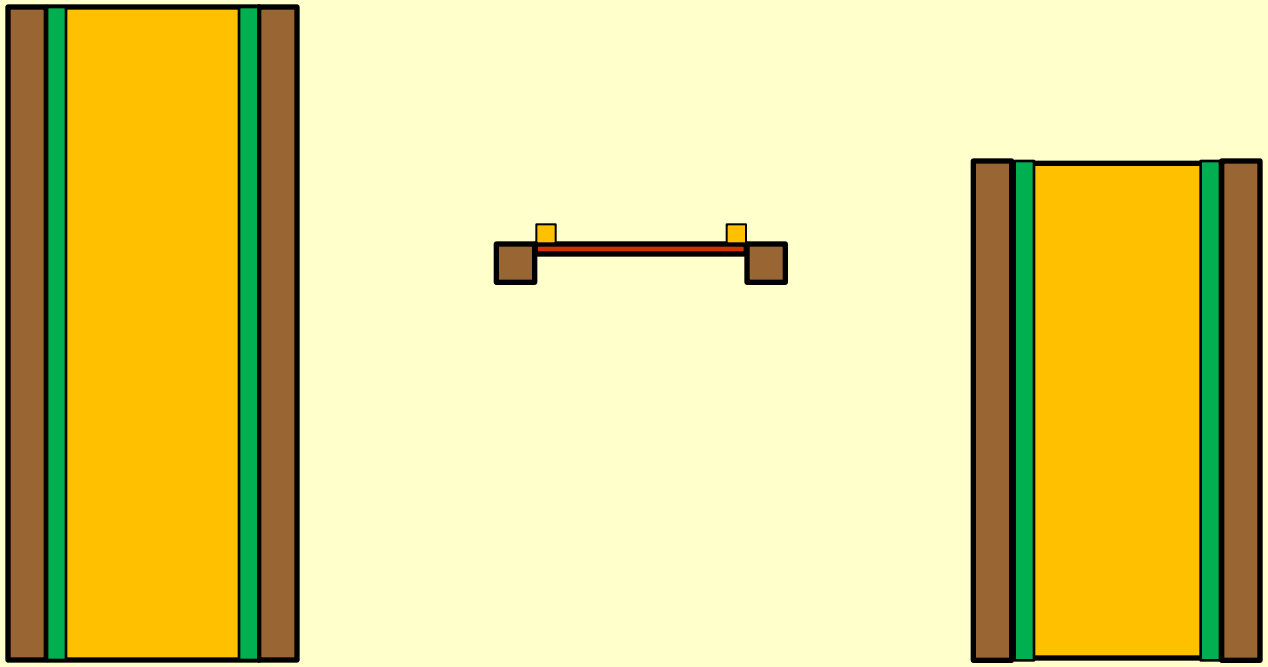
Repeat the drill & insert rod process for the inside legs



Scratch Build a Water Tower

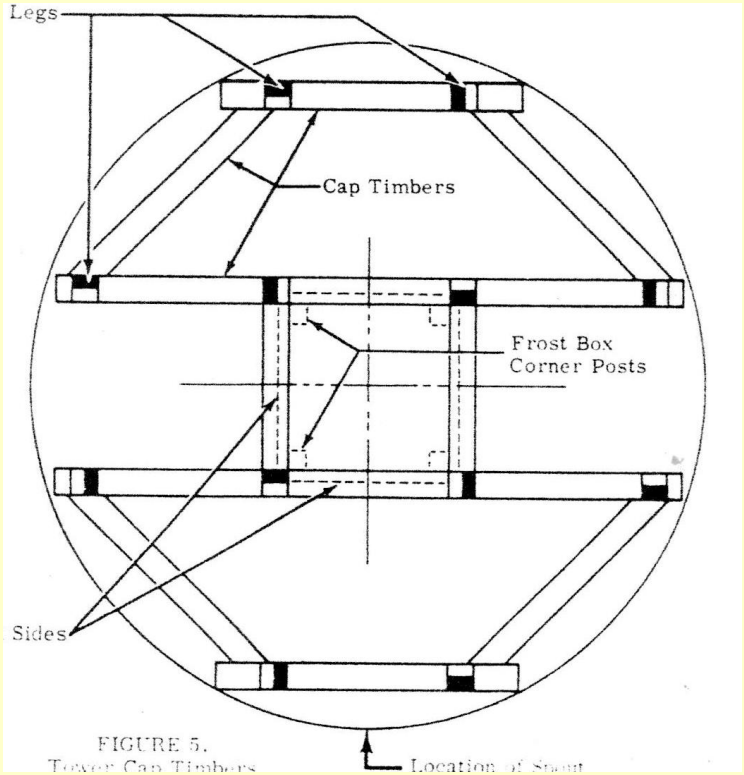
Now turn the long bents over and add **inside supports** using **6x6 material** along the seam between the wall and the leg

This will form an inside corner for the side walls of the frost box



Scratch Build a Water Tower

Cut out the footprint template and tape it to your work surface



Option:

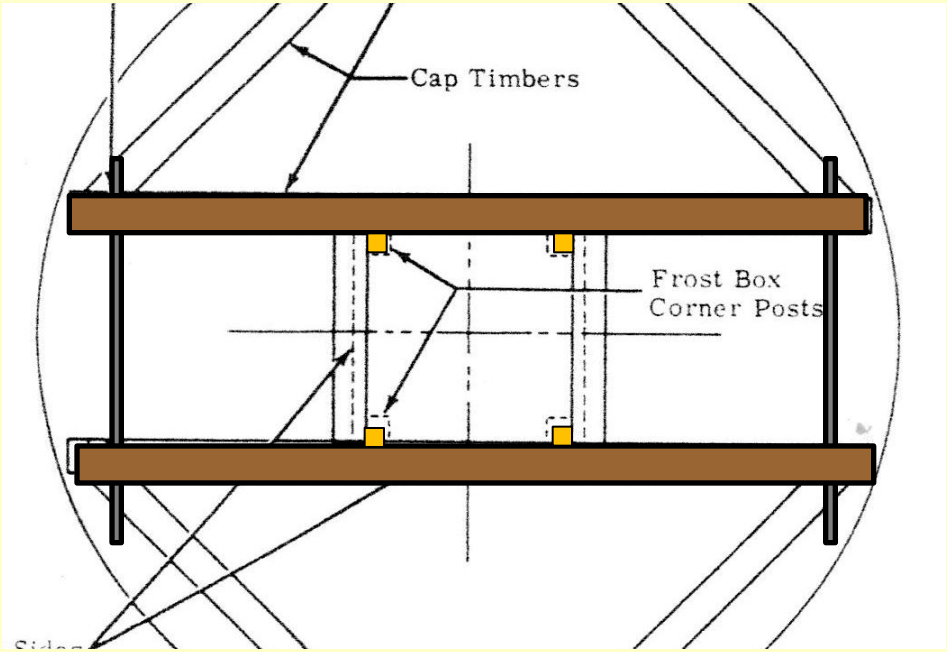
Cover the template with wax paper and use double sided tape

Or

Glue directly onto the template and clean up after

Scratch Build a Water Tower

Re-insert the over length rods through the outside legs of the long bents and secure the long bents to the footprint template



Scratch Build a Water Tower

Add X-Bracing between the two long bent assemblies

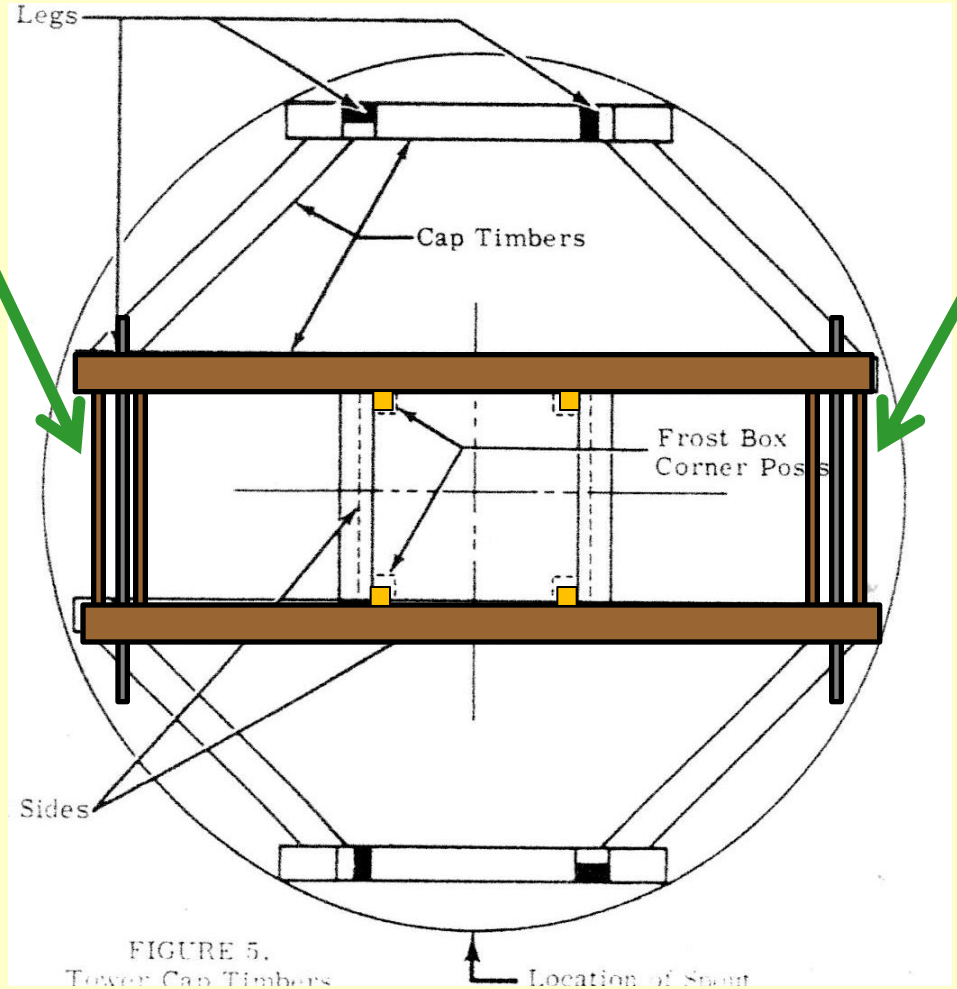


FIGURE 5.
Tower Cap Timbers

Scratch Build a Water Tower

Finally, add the two side walls of the Frost Box

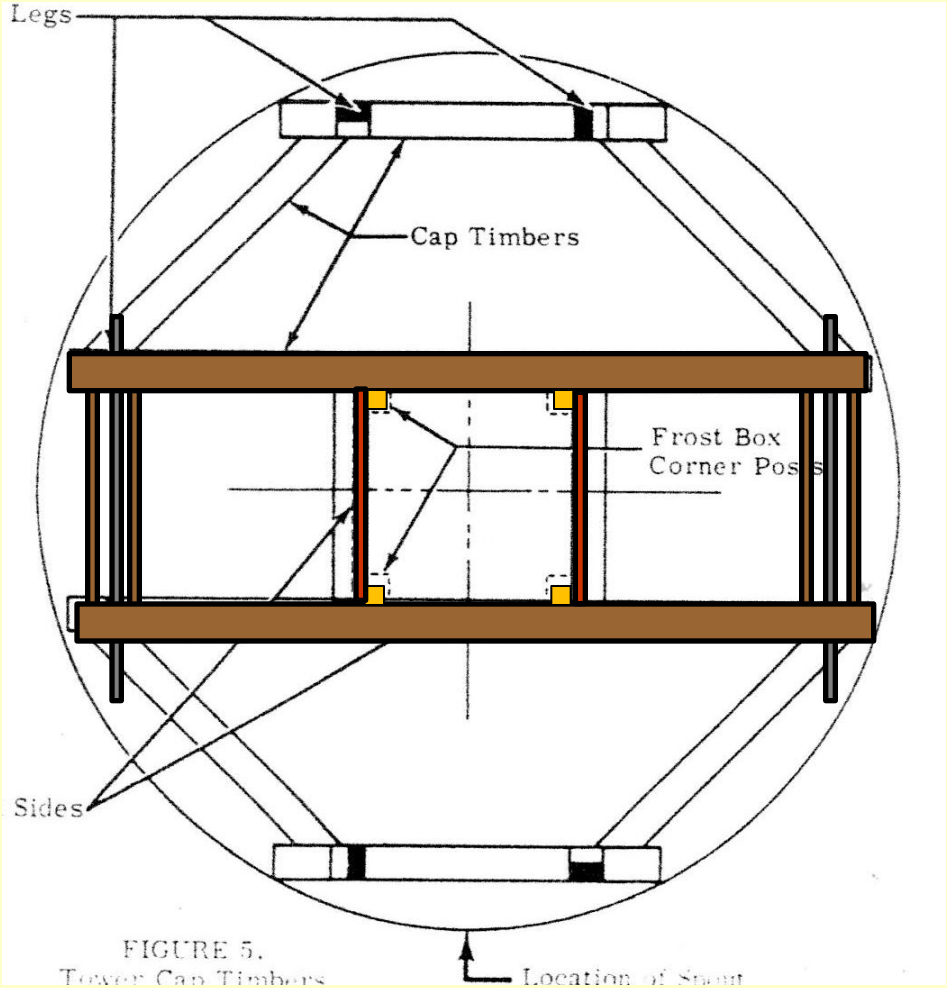


FIGURE 5.
Tower Cap Timbers

Note: If you've chosen to not add a Frost box then add X-bracing between all for inside legs

Scratch Build a Water Tower

Now, insert over-length rods into a short bent assembly and attach to the template

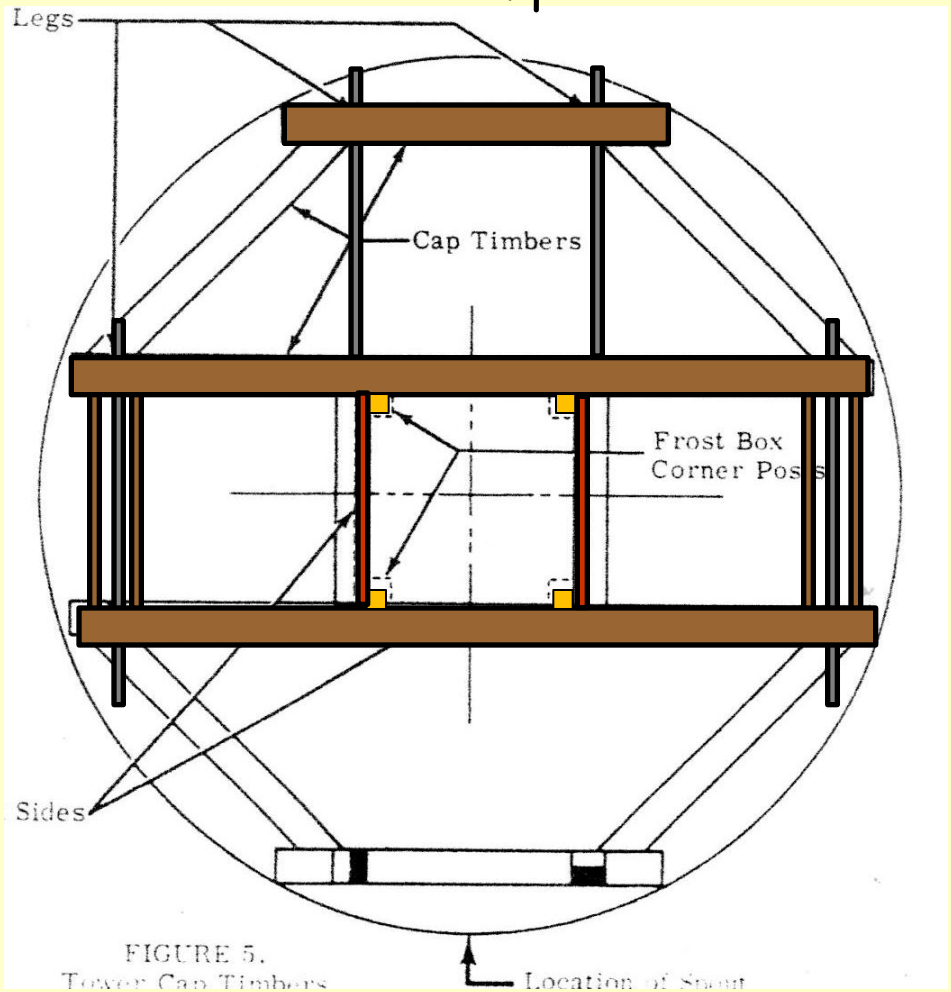


FIGURE 5.
Tower Cap Timbers

Scratch Build a Water Tower

Then add X-Bracing between the short bent and the center legs of the long bent

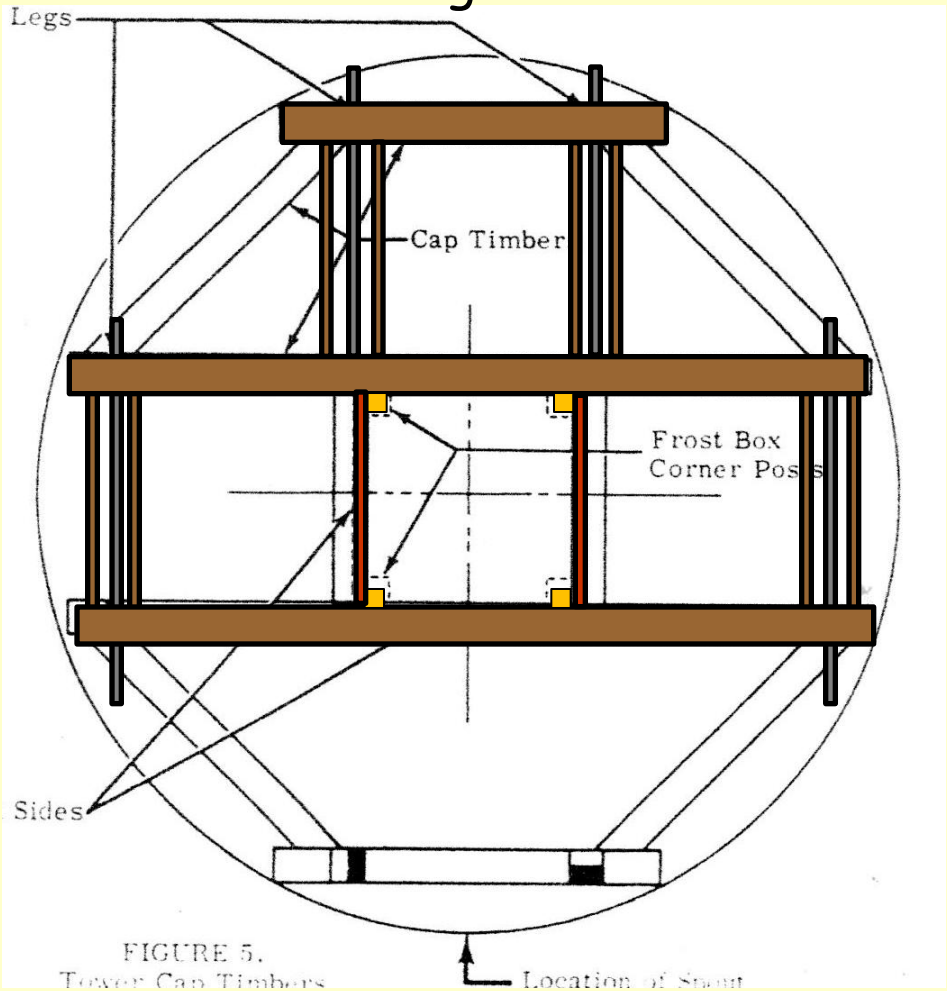


FIGURE 5.
Tower Cap Timbers

Scratch Build a Water Tower

Repeat for the back side

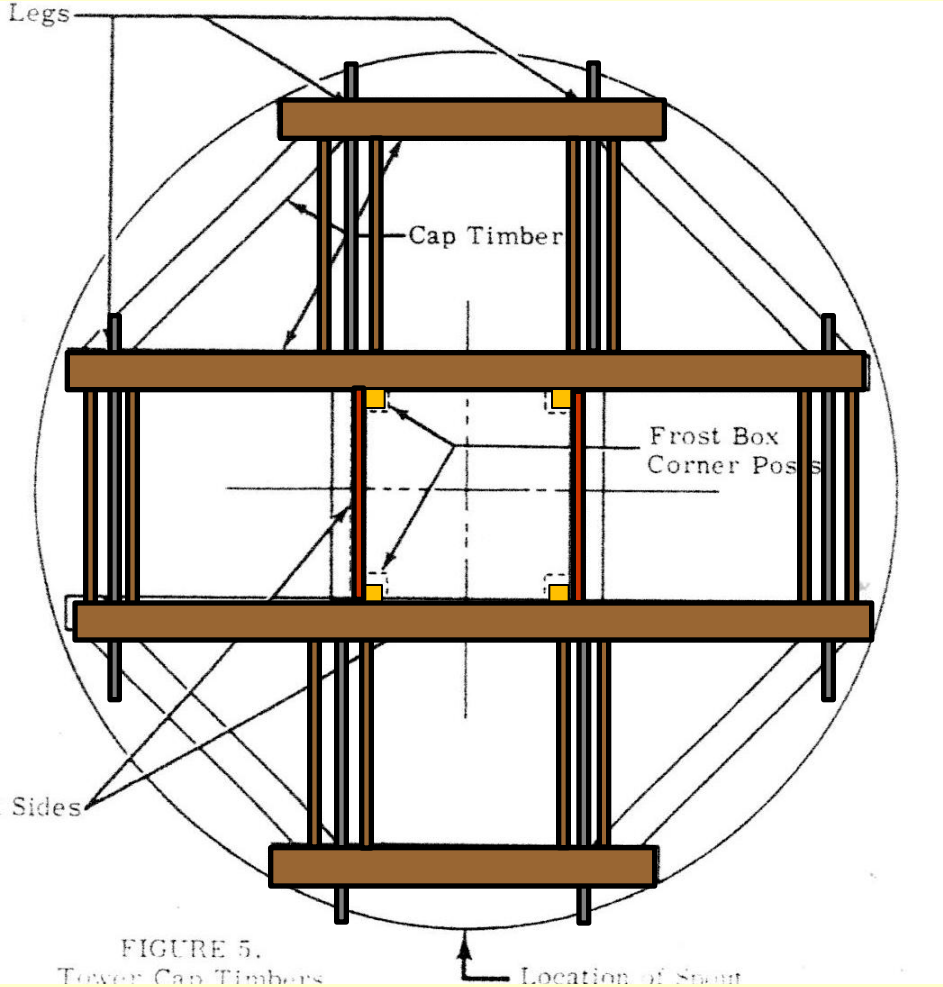


FIGURE 5.
Tower Cap Timbers

Scratch Build a Water Tower

Now carefully cut and add the 4 diagonal Cap Timbers

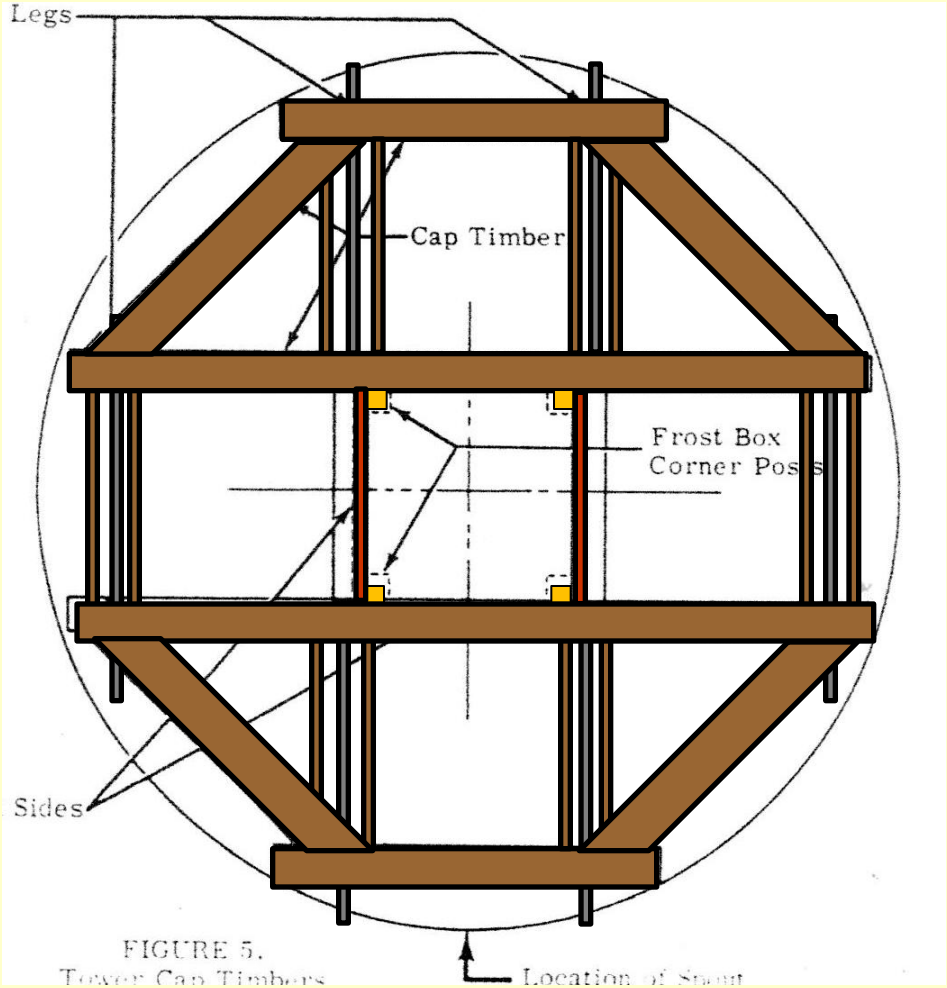
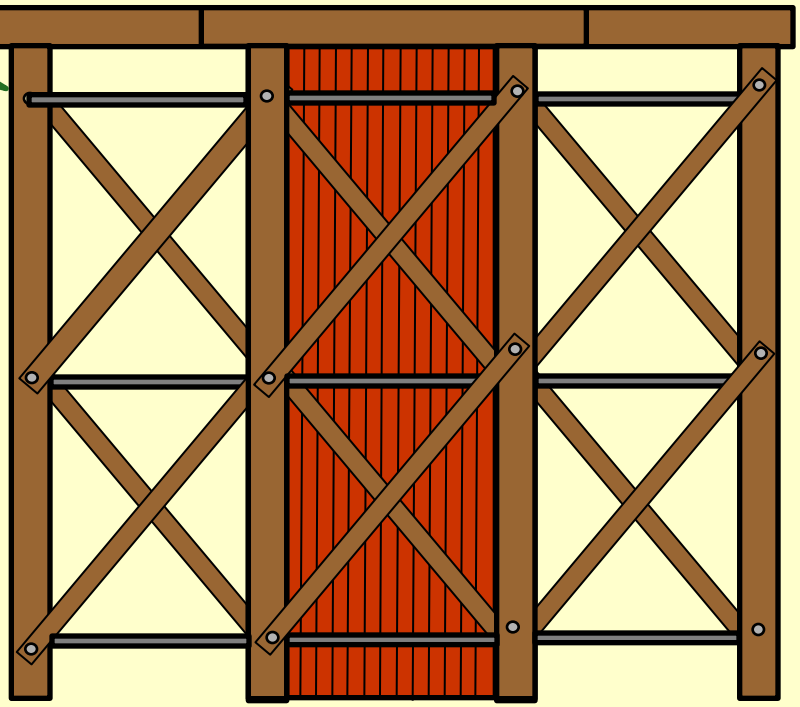


FIGURE 5.
Tower Cap Timbers

Scratch Build a Water Tower

Now remove all the over-length rods and cut them to size, re-insert and secure with ACC

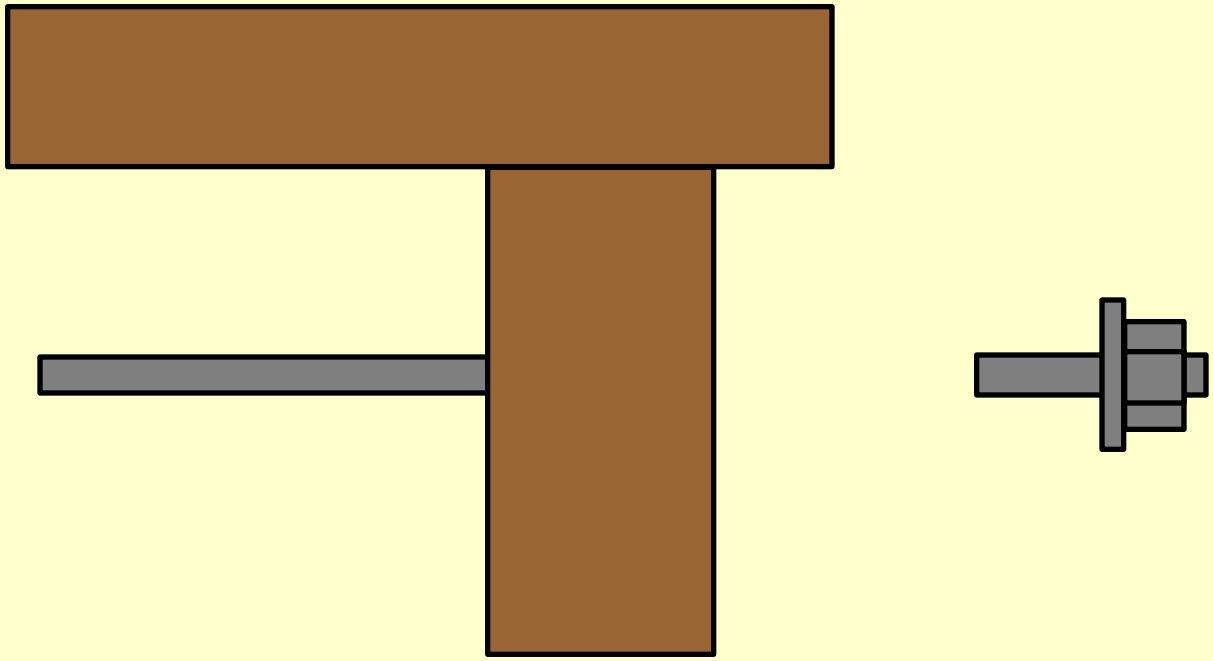
Shown on outside of leg to demo length



The length should be slightly shorter than what it would take to go all the way through both legs so that the outside is recessed sufficiently to accept a Nut-Bolt-Washer (NBW) casting

Scratch Build a Water Tower

Get out the Optivisors and the tweezers, it's time to add the NBWs

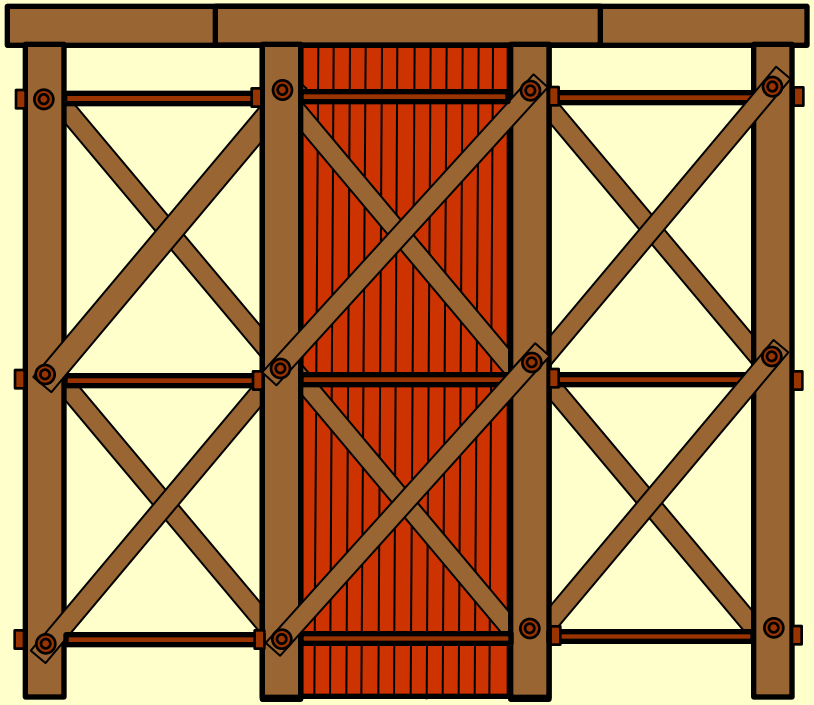


Cut the NBW from the sprue, leaving a short shaft,

dip the shaft in ACC and insert into the rod holes

Scratch Build a Water Tower

Once all the NBWs are installed
paint them and the tension rods a rust color



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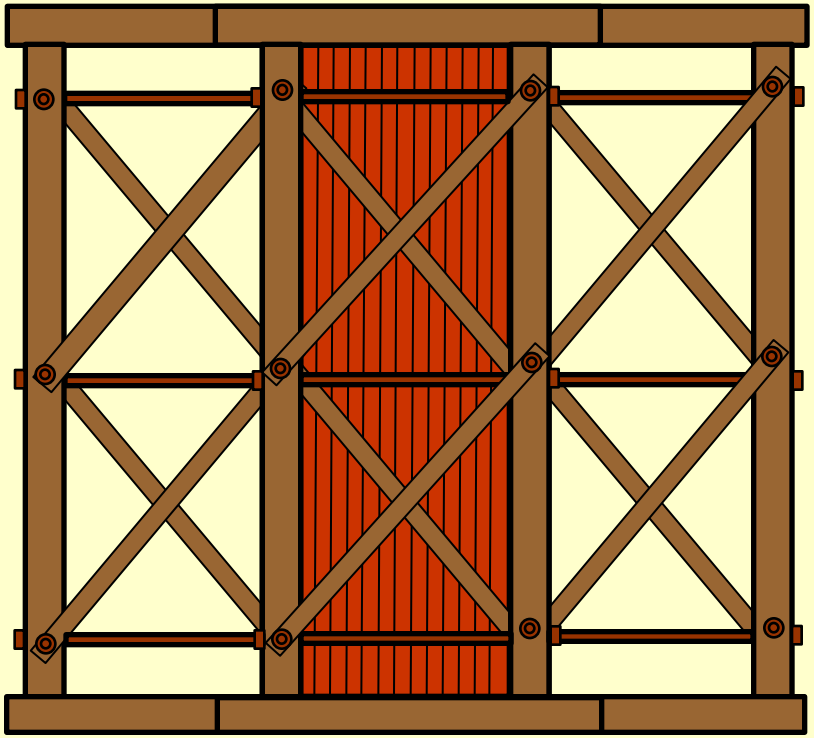
If you are planning on Timber footings then duplicate the long and short Cap Timbers out of 12x12 material and attach under the legs parallel to the Cap Timbers



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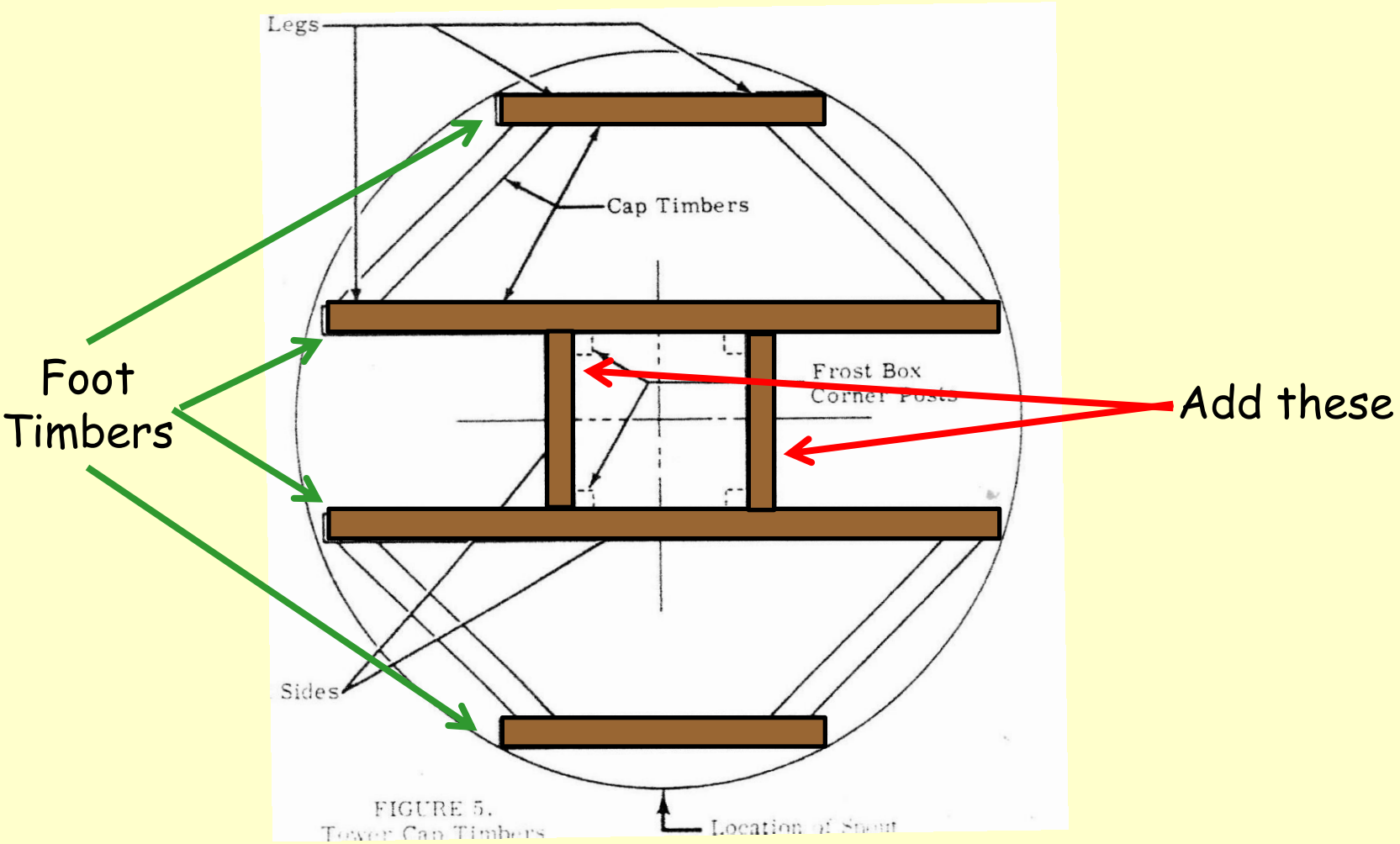
Then cut short timbers from the 12x12 material and add under the two Frost box side walls to form a square



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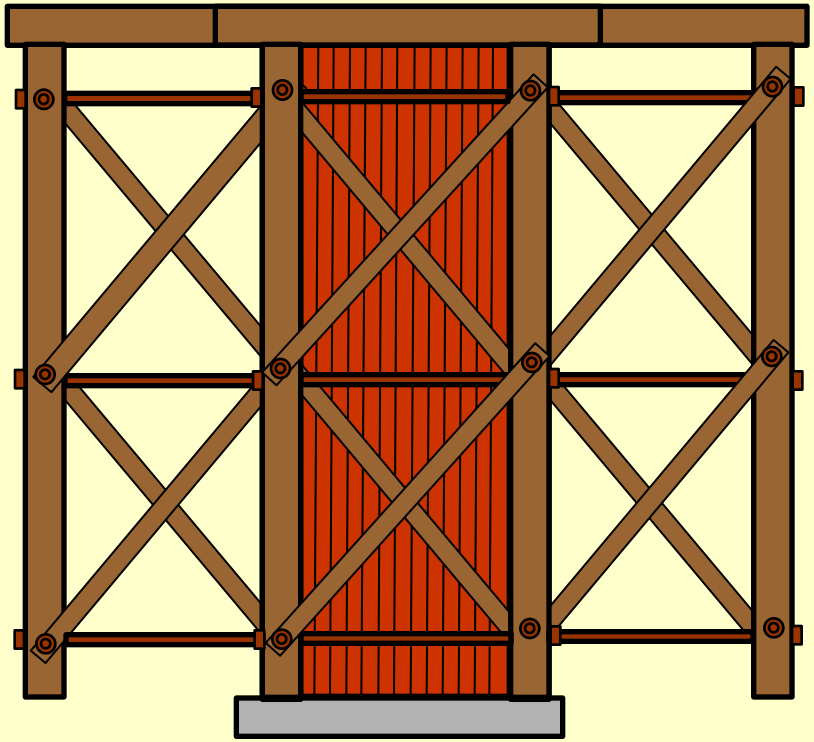
If you desire a concrete base then cut a block 8'6"x8'6"x12"

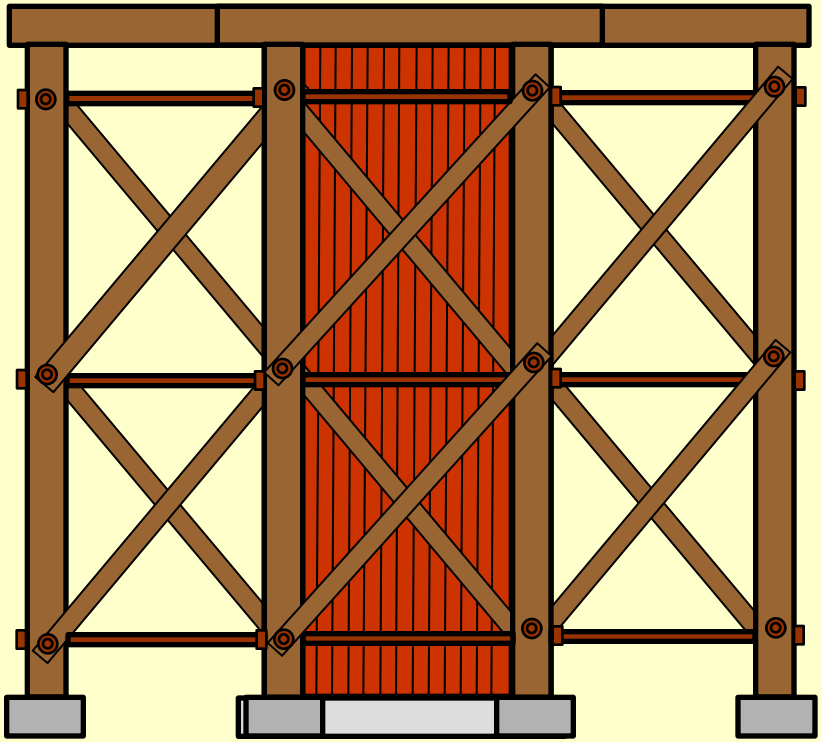
And glue it centered under the Frost box



Scratch Build a Water Tower

Then cut 8 blocks 24"x24"x12"

And glue them centered under each remaining leg



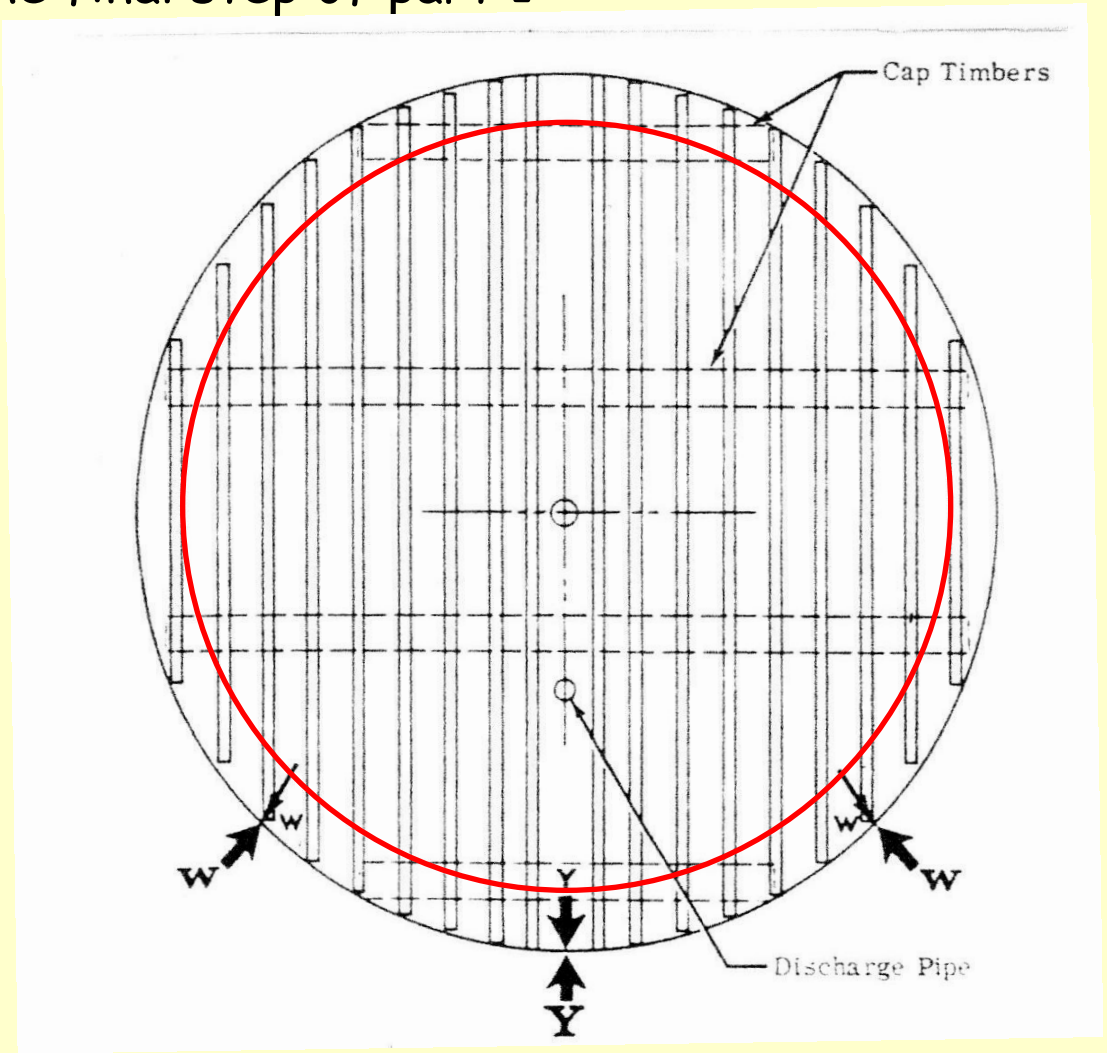
If desired, file a slight taper on all 4 sides of each leg footing then paint them an "Aged Concrete" color

Scratch Build a Water Tower

For the final step of part 1

For the next step, cut out and secure the Floor Joist Template to your work surface

If your desired tank is not the same diameter as the template, redraw the diameter onto the template before cutting joists



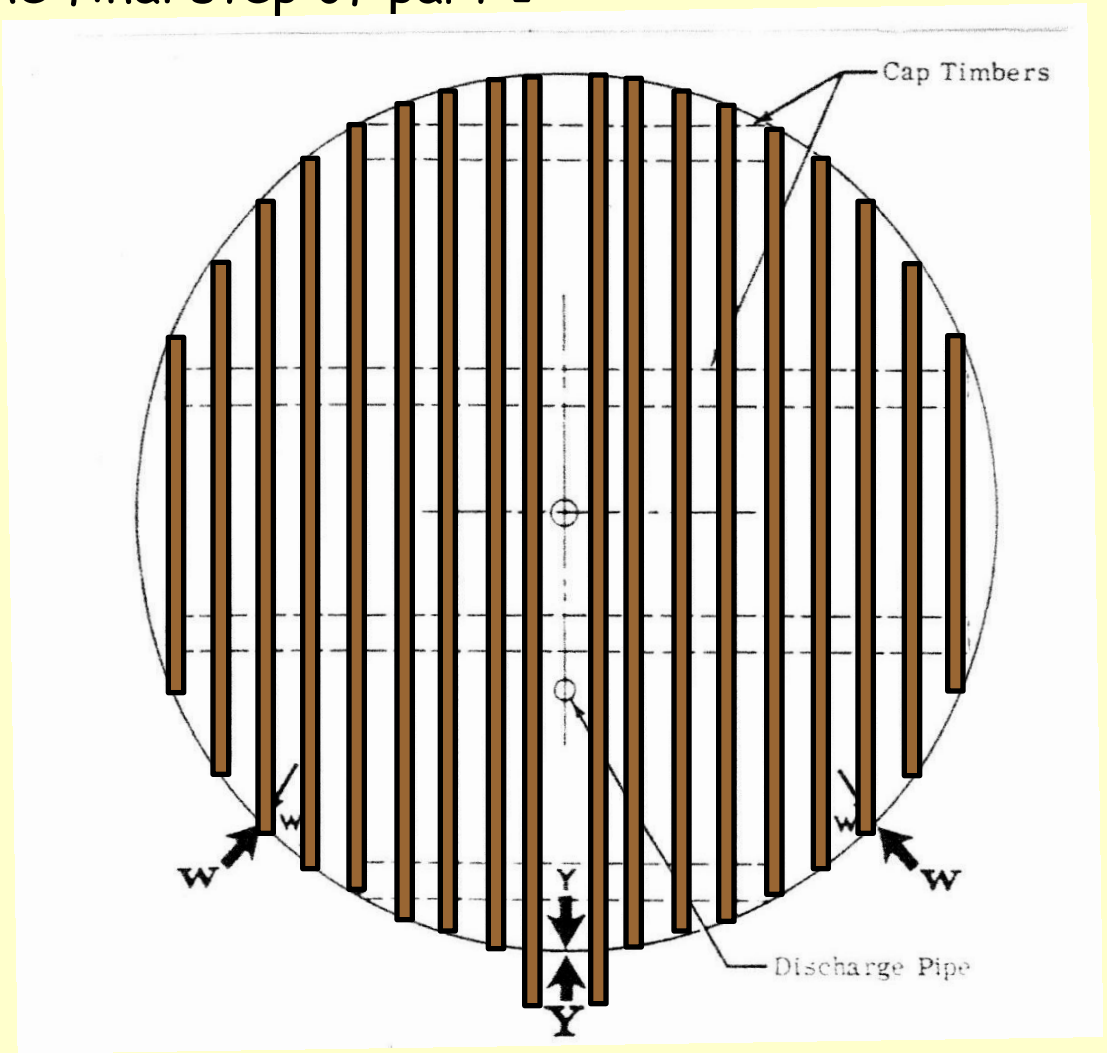
Scratch Build a Water Tower

For the final step of part 1

Use the Tank diameter circle as a guide and cut to 2 of each length of the floor joists out of 4x12 material

Then tack or double side tape them on the template

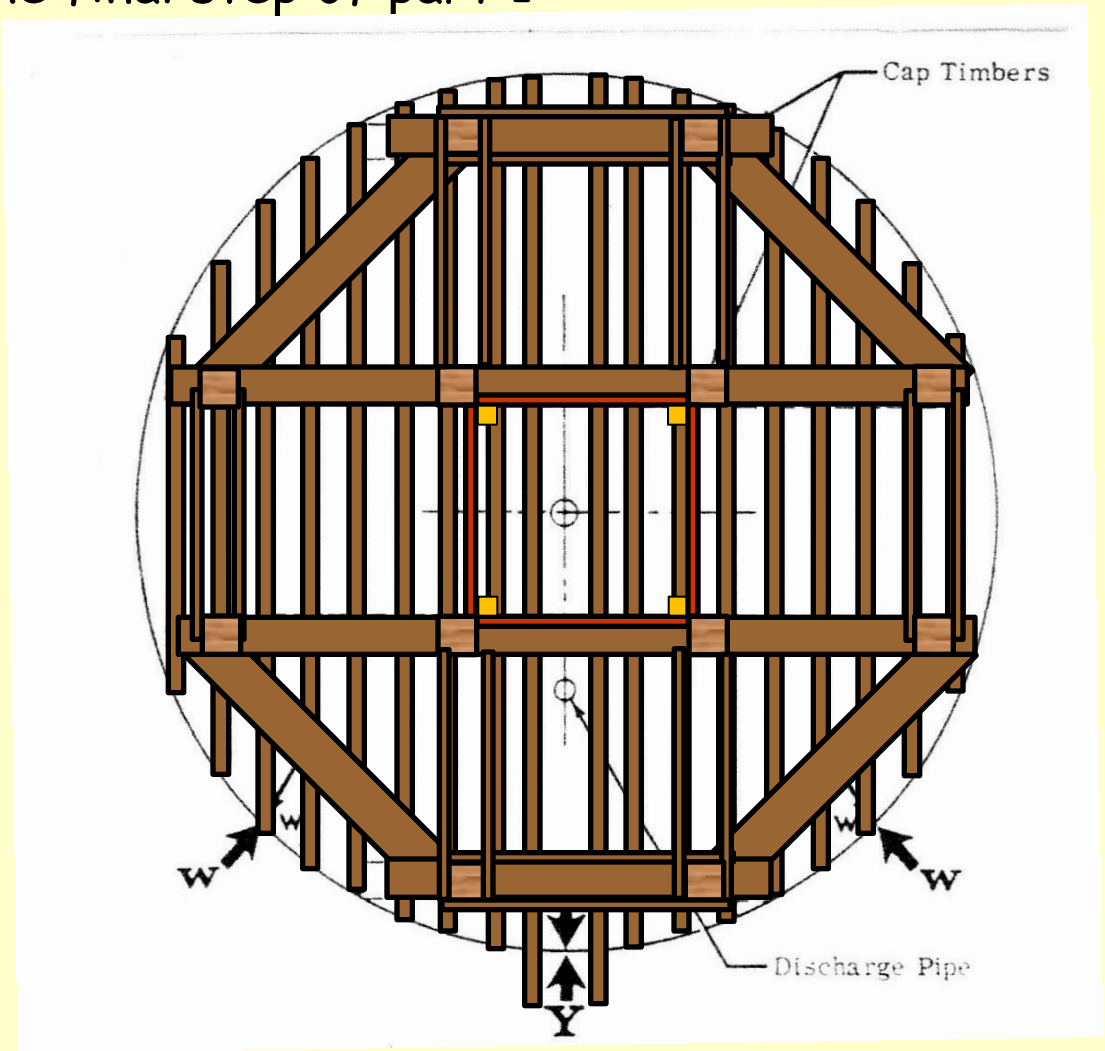
Note how the center two joists extend past the diameter, these help support the water spout



Scratch Build a Water Tower

For the final step of part 1

Now spread some glue on the top side of the cap timbers, turn your assembly upside down and pace it on top of the joists aligning with the template marks for the Cap Timbers



Put a weight on it and let it dry completely

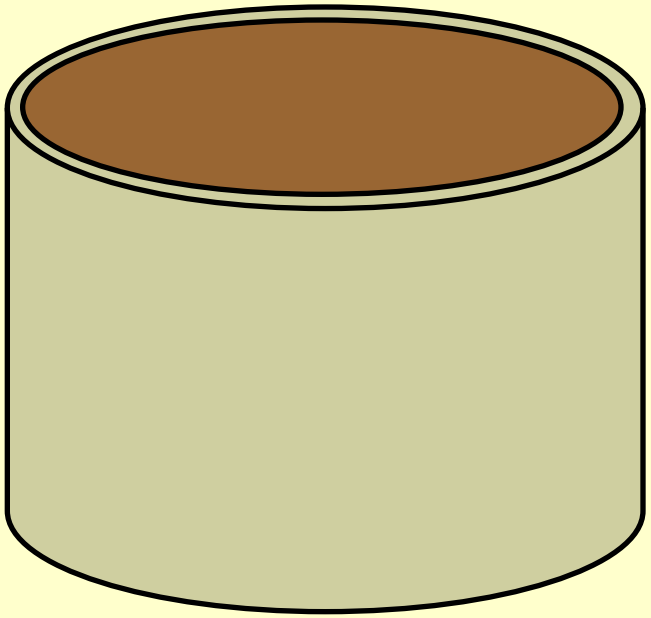
Scratch Build a Water Tower

Congratulations, you've made it through part 1 of scratch building a Water Tower!

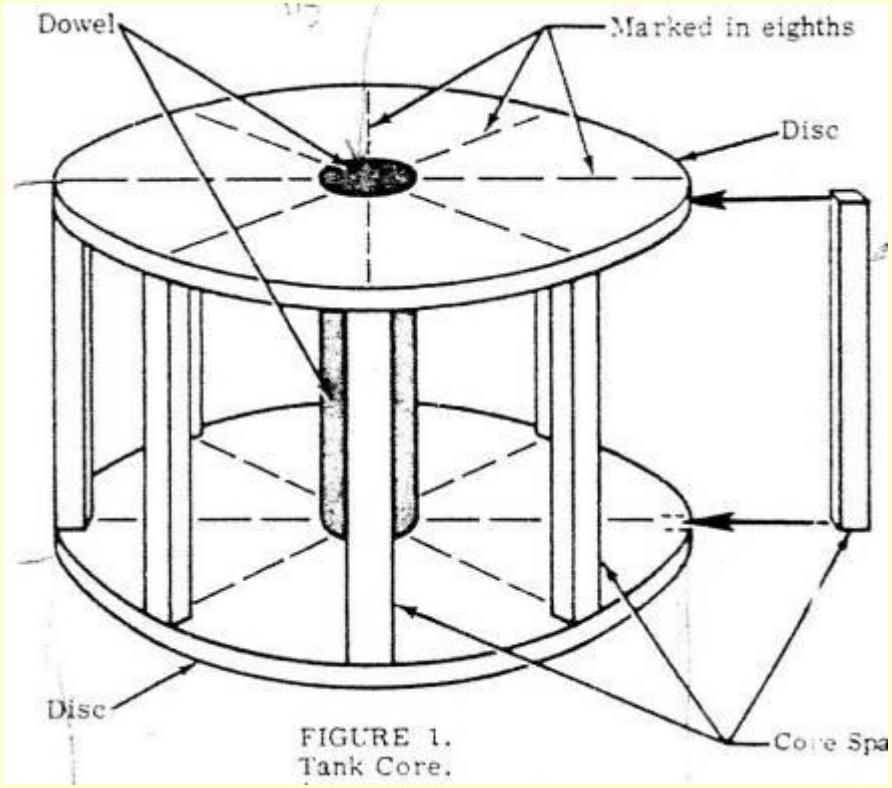
Your project should now look something like this

Scratch Build a Water Tower

Next month, we'll build the tank itself
There are TWO ways to do this…



Use a Tube
(Cardboard for wood)
(PVC for styrene)



Build a Core out of Cardboard and wood or out of styrene

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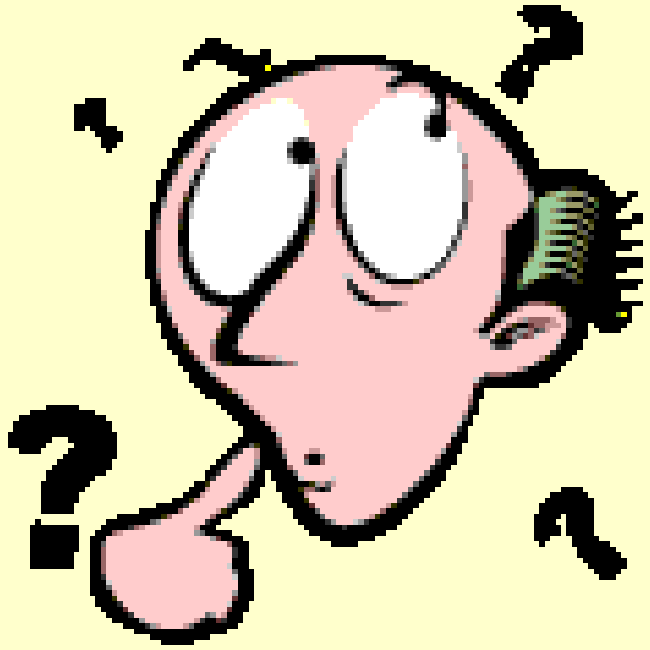

Questions?